VOL. 6 JULY • 1949 NO. 3

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JRNAL OF THE CANADIAN SOCIETY OF RADIOLOGICAL TECHNICIANS

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News Items from the Provinces

ALBERTA SOCIETY OF RADIOLOGICAL TECHNICIANS

ALBERTA SOCIETY HOLDS ANNUAL CONVENTION

The Annual Convention of the Aberta Society of Radiological Technicians was held in the Colonel Belcher Hospital, Calgary, May 13th, 14th and 15th, with Miss T. St. Hilaire in the Chair.

Mr. H. M. Welch introduced Dr. J. K. Mulloy, Medical Superintendent of the Colonel Belcher Hospital, who most graciously offered us the use of the Hospital for our meeting this year. Dr. Mulloy expressed his pleasure at having the Convention in the Hospital and extended a welcome to all in attendance. He commended the Society on its work and wished us a successful and enjoyable Convention.

During the business sessions various matters were dealt with and the following decisions arrived at:

That commencing January, 1950, the Secretary-Treasurer be appointed for a three-year term and an assistant for a period of one year. Committees were formed to study the question of obtaining a Provincial Charter to the A.S.R.T. and another to investigate the wages and working conditions of technicians in Alberta. It was also decided that a cap would be used by the female technicians of our Society and a committee was appointed to arrange the type of cap to be worn. Considerable discussion took place on C.S.R.T. matters and resolutions to be presented at the coming Dominion Convention. Director H. M. Welch explained the various points as they were brought up.

The following papers were presented during the Convention:

Dr. Townsend of the Red Cross Crippled Children's Hospital spoke briefly on the growth of the hospital from its meagre beginnings in an old house to the new large modern hospital now under construction in West Calgary for the treatment of crippled children. He spoke of the advances made in treatment and orthopedic surgery which were now making possible the leading of fairly normal lives of many cripped children, most particularly the indigent. He then showed us a film of a typical day at the hospital. The operation performed on club feet was photographed as well as the treatment and help of many types of congenital disfigurements and infantile paralysis victims. Both the lecture and the film were very informative and thoroughly enjoyed by all.

Dr. J. I. Mitchell gave us a paper on the use and help of x-ray in the diagnosis of urinary ailments. He outlined the type of examination required, whether retrograde or intravenous pyelograms, which might be of assistance to the Urologist in his treatment or where surgery is indicated. Dr. Mitchell also showed radiographs of the particular application of each and where the use of each is indicated.

Miss F. Shaw of Calgary gave a paper of "Odds and Ends Regarding Children," which was very informative and enjoyed by all.

Miss Peters read a paper prepared by Dr. M. Mallet, who was unable to attend, on "The X-ray Student." This was very well received and a motion was put forward suggesing that this paper be copied and given to all students entering this field of work. Mr. Welch asked that it go on record that a hearty vote of thanks be sent to Dr. Mallett for the splendid paper to the Convention. This paper is also to be sent to The Focal Spot for publication in the near future. Miss Shaw moved we have it mimeographed for all students; this was seconded by Miss Fergstad.

Movie films supplied by the General Electric Co., "Exploring with X-Rays," and "Taking the X Out of X-rays," were also shown.

On the 13th a delightful banquet and dance was arranged by the Calgary Society in the Officers' Mess at Mewatta Barracks. The evening began with cocktails at 6.30 and at 7.00 a banquet was served. The toast to the Radiologists was presented by Mr. E. Wheeler and responded to by Dr. J. J. Porter. Dr. K. D. Symington proposed a toast to the technicians which was responded to by Mr. G. Hall. Guest speaker for the evening was Dr. F. S. Morley, B.D., Ph.D. (Edin.). Dr. Morley spoke on

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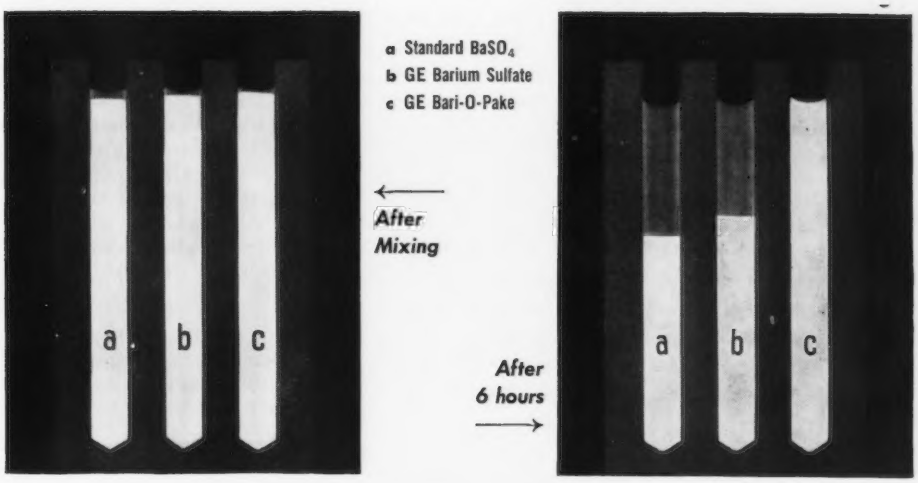

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"Democracy," thoroughly enjoyed by all. Dancing followed the dinner.

Mr. George Hall of Edmonton thanked the Calgary Society on behalf of visiting delegates for the splendid reception and entertainment of the out-of-town delegates. Mr. H. M. Welch, as convention chairman, replied and expressed the satisfaction of the Convention Committee on the excellent attendance of technicians from Edmonton and various points in the Province.

On the final day the Calgary Society took all the delegates for a day at Banff, which was very enjoyable.

The thanks of our Society are extended to all who helped to make this a most successful convention and as usual this includes all the service men.

—SHIRLEY GRIEVE, R.T.,
Sub-Editor.

EDMONTON SECTION

On April 4th the Edmonton Society held a short business meeting at the General Hospital to discuss preparations and transportation arrangements for the coming convention in Calgary.

Two new members were welcomed into our local Society: Sister Rosario and Sister Mary Albin, both of St. Joseph's Hospital.

On May 9th, at the Misericordia Hospital, Dr. H. R. MacLean spoke on dental radiography. He compared dental with medical equipment; described the various types of films used, oral, occlusal, bite-wing, etc.; named the different devices employed to hold the dental packet in the mouth; showed positioning for radiography of teeth, jaw and occlusal plane. He illustrated his talk with slides and models and displayed on the view box radiographs of abnormal teeth. Dr. MacLean has given us the easy approach to dental radiography and, we hope, has helped change the attitude of some of us towards "a set of teeth."

The second week-end in May saw about fifteen members of the Edmonton Society attending the provincial get-together in Calgary. Thanks to the splendid teamwork displayed by our fellow-technicians of the South we have enjoyed every bit of the program and are looking forward to the day when Edmonton may repay the courtesy.

At the meeting of June 6th in Dr. Mallett's office, Miss Vera Peters, provincial secretary, gave a detailed report of the Provincial Convention for the benefit of those who were unable to attend. Several topics for discussion arose out of the minutes. Several issues of import necessitated a second meeting to be called on the following Monday with a better representation of members.

Within the last month, lady technicians in Edmonton have adopted a small white cap as part of the uniform. The cap is the symbol of your profession, wear it with pride and dignity.

Miss Lenore Galarneau of the May class of '49 has left the Misericordia Hospital and accepted a position in New Westminster, B.C.

After spending three months of training in a regular x-ray laboratory, Mr. Edward Chyzowski took to the road again with Mobile Unit No. 2.

Miss Charlotte Sande, R.T., paid a visit to her Edmonton friends recently and announced that she was on her way to a new field of action. Se is now posted at the hospital in Lloydminster.

Several technicians have already been away for holidays. Miss Teresa McNeil is just back from a wonderful trip to Vancouver with her father and mother.

The Society has closed its activities for the summer months.

—SISTER MARIE LEFORCE, R.T.,
Sub-Editor.

CALGARY SECTION

Dr. Thorson opened our April meeting of the Calgary Society of X-Ray Technicians with a very interesting and enlightening lecture on "Radiography in Relation to Heart Disease." The lecture was delivered at the Colonel Belcher Hospital with seventeen members present. Mr. Stan Katherns brought along a list of film titles from the General Electric Co. and it was decided to send away for the film on "Taking the X Out of X-Rays."

Main items for discussion at the meeting were

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fees for Associate Membership and Sick Leave Membership.

Four x-ray firms graciously contributed to our Convention expenses.

Mr. Cece Bridgeman was presented with a gift for his diligent work and efforts in lecturing on Physics. I am sure our May candidates found them very helpful. Again, Good Luck! kids—they will soon be over.

On May 17th the meeting of the Calgary Society of X-Ray Technicians was held in the auditorium of the Colonel Belcher Hospital. Mr. H. M. Welch thanked the various committees for their time and loyal support in making the Convention a success. Forty-three members registered at the May gathering, twenty of whom were from out-of-town.

Mr. Ross Boulton was appointed as the Chairman of the Committee for the resolution dealing with Working Conditions. He is to be assisted in this by Miss Grieve and a member of the Edmonton Society.

Miss E. Shortt and Mr. E. Wheeler were appointed to work on a committee with two members from the Edmonton group to deal with the incorporation of the Alberta Society.

The associate membership fees were again discussed. Two dollars was the amount decided upon, with one dollar and fifty cents for The Focal Spot.

Mr. J. L. Welch was appointed Chairman of a Committee by the C.S.R.T. to investigate the possibility of increasing the number of examining boards across Canada. It was suggested that there should be four.

Mr. Ross Boulton suggested a weiner roast to take place June 21st at Paradise Grove. Mr. J. L. Welch seconded the motion and plans were made. Meeting adjourned.

On June 21st we all gathered down at the Col. Belcher Hospital at 7.00 p.m. Cars were arranged to carry all of us out to the picnic spot. Firewood and roasting sticks were soon in readiness and our accordionist quickly put a gay note in every one. The weather was lovely and a good time was had by all. Many thanks to Ross and his committee.

—SHIRLEY GRIEVE, R.T.,
Sub-Editor.

BRITISH COLUMBIA SOCIETY OF X-RAY TECHNICIANS

Two meetings were held in May. On May 9th, through the courtesy of the General Electric Corporation we had the delightful pleasure of listening to a most interesting lecture on High Kilovoltage Technique, delivered by that very able speaker, Mr. Dale Trout. All members who attended unanimously agreed that it was very much worthwhile. Dr. Bede Harrison expressed the deep appreciation of the Society to Mr. Trout in a well expressed vote of thanks. Refreshments were served and during this period our members were able to ask Mr. Trout many questions.

At the meeting held on May 19th, Dr. J. W. Vosburgh of the Vancouver General Hospital, addressed the meeting on the Anatomy of the Ventricular System. Dr. Vosburgh handled a difficult subject in a very capable manner. Our old friend, Mr. W. Pepper, moved a hearty vote of thanks to the speaker.

The Vancouver Island technicians had a very enjoyable meeting which was addressed by Dr. Roberts of Victoria. Miss Patterson moved the vote of thanks.

The June meeting was held on the 16th, and the Resolutions to be presented at the Dominion Convention were fully discussed and the Official Delegate advised as to the action to be taken. Through the efforts of Mr. Herb Black and Mr. Bert Merrin of C.I.L. we had the pleasure of hearing Mr. Bill Turner of Patterson Screen Division of DuPont in an address on Intensifying Screens. This was an unexpected pleasure and Mr. Bill Stirling moved a hearty vote of thanks to Mr. Turner and the C.I.L. representative for their contribution.

Mr. Len Martin of General Electric X-Ray Corporation addressed the Victoria members at a meeting recently held in the Capital City.

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EDITOR
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Volume 6 TORONTO JULY 1949 *Number 3*

"All our ambitions should be devoted to a faithful fulfilment of duties towards others as well as to ourselves."—Roentgen.

Dark Room Procedures

By P. E. HUNT, R.T.
Supervisor, X-Ray Technical Services
Saskatchewan Health Planning Commission

Introduction

A PRELIMINARY survey of x-ray services and facilities at many hospitals has revealed that a large proportion of the poor films presented to physicians and specialists for interpretation, are the result of inadequate care of the film in the dark room.

In most cases, this is obviously the direct result of the lack of knowledge of the facts involved by untrained personnel who have been made responsible for technical procedures. In the larger hospitals, employing trained personnel, it can be shown that such poor results are due to errors of commission and/or ommission.

This paper has therefore been prepared for the guidance of those having to do with technical procedures, in the hope that it will assist toward the provision of better quality diagnostic radiographs, thus improving one of the services so vital to physicians, who, in turn, are thus assisted toward a correct diagnosis and consequent adequate care of the patient.

The author makes no claim for originality except, perhaps, in the manner of presentation of already well known facts. Well known, that is, to personnel trained for service as x-ray technicians. Its submission for publication in this journal was governed primarily by the thought that it might have some teaching value insofar as student technicians were concerned.

It must be emphasized that to theorize about the factors involved does not of itself provide a solution to the problem. Knowledge of theory must be followed by practicol use of whatever we might know or learn about the subject.

Moreover, having reviewed the major causes of the poor results, it is hoped that this will be followed by immediate adoption of carefully worked out systems of procedure, with a consequent rise in the technical quality of radiographs.

The Problem of Light:

When they reach us from the manufacturer, x-ray films consist essentially of clear sheets of celluloid, on which is spread a very thin film of gelatinous mixture containing silver salts or bromide. This thin layer is known as the emulsion, and is photo-sensitive. That is to say, it is susceptible to the effects of the action of Light, Roentgen radiation and/or Radium. Of these, Light is without doubt the commonest hazard to be dealt with by technical personnel.

The manufacturer plays his part by enclosing each film in an individual paper wrapper, then providing additional wrapping for each group of twelve, fifteen or more, and then carefully packing each group into a light-proof container.

Our responsibilities, so far as exposure to light is concerned, begin at the moment we break the seal of the container. From

that time on, we must see to it that there is no possible chance of exposure of the film to harmful light until the radiographic and processing work is completed. In this connection, it is better that you should think of all light as a hazard, no matter what the quality and no matter how little.

Of immediate concern, therefore, is the matter of providing adequate safeguard to the film by proper design of the dark room, and by correct thinking in relation to dark room environment.

Possible sources of leakage of light into the dark room are through ill-fitting doors, keyholes, windows that are poorly shuttered, joints in walls and partitions, entry places or plumbing and electric conduit, etc.

Within the dark room itself, the commonest source of trouble is from a safelight that permits the passage of light through some part of the assembly other than the filter provided. Fifteen minutes spent in the dark room, with the door tightly closed and by moving your position to various angles of the room will reveal these hazards to you. They should be corrected.

Unfortunately, too many people take the term "safelight" too literally, for it may be truly said that none are really safe. Filtered or controlled illumination might be a better term, since it would serve to remind us that safelights, to be of good service to us, must be kept under close control. Many of the less expensive models permit the escape of white light, and should be carefully examined for flaws. To place a forty watt bulb into the average safelight assembly and to mount it within four to six inches of the developing tank is to invite disatrous results, yet it is still done!

As a guide toward the maximum permissable illumination to use during the loading and processing period, it is fair to say that with a Wratten 6B filter and a twenty-five watt bulb installed in the safelight, an area of about sixty square feet is amply illuminated at a distance of five feet from the safelight. It is therefore evident that such an assembly may be mounted so as to give ample light to the whole of the work area adjacent to the loading bench and the processing tanks.

Should circumstances compel the placement of the safelight assembly closer than five feet to the work area, the use of a fifteen watt bulb is indicated.

We shall return to this subject later, when an attempt will be made to show how, with an arrangement such as is indicated above, it becomes comparatively easy to demonstrate the potential photochemical effect of such illumination, if present to any harmful degree.

Development of the Image:

The basis of Radiography, reduced to its simplest terms, is that when one places between the source of Roentgen radiation and the film, any object made up of a mixture of bone, muscle, fatty tissue, et cetera, and this object is bombarded by radiation, the photographic effect on the film will depend primarily upon the ease with which the radiation penetrates the object to reach the film.

Where penetration is easily accomplished, the potential photographic change will be very marked. The opposite is also true. Where the film has been protected, as it were, from the action of the radiation, by dense bony structures, there might be little or no effect.

However, this potential photo-chemical change created on the film thus far will remain hidden, or to use the correct term, latent, until we subject the film to the

action of certain chemicals in solution. We call this process development, the name being very descriptive of the function, since we are, by means of a chemical process, developing a hidden or latent image in order that it may become actually visible to us.

What actually happens is that the silver bromide salts present in the emulsion, which have been subjected to the action of radiation and are ordinarily colorless, are changed, under the action of the developer, to silver oxide, black in color, the degree of "blackening" depending primarily on how intense was the radiation reaching the film, and how active the developing agent might be. Any sections of the film which have been protected against the potential effect of light or radiation will be unaffected by the developing bath, and therefore will not change color.

Thus, very simply, is told the story of the foundation by which we are able to produce shadowgraphs by means of Roentgen radiation.

We cannot, howver, stop at this point, as if it were the end of the whole process. As a matter of fact, it would be to our advantage to review in theory what would have occurred following exposure of a film in practice.

We would have a film which has been subjected to the effect of radiation, hence a hidden change created in it, and we have placed this film into a chemical bath for the purpose of changing the affected silver bromide to silver oxide.

Do we per permit this developing process to go on indefinitely?

What of the *unaffected* silver bromide on that film?

Is it still sensitive to light or radiation?

The silver oxide image — (black in color, remember?) — is it permanent at this stage?

Good questions, all of these, and if we are to acquire a full understanding of the processes involved, perhaps a good way would be to seek the answers to these questions in order as they are here set down.

The extent to which we permit the developing process to proceed is very definitely controlled with certain rules of procedure to follow and three major factors to contend with:

1. The temperature of the developing bath.
2. The amount of work that the bath has already done for us.
3. The length of time that the film is permitted to remain in the bath.

Reviewing the above, it must be remembered that for the moment, we are only concerned with the developing process and that there are many other factors. which, outside of the processing room, control the final degree of "blackening." For the purposes of this paper, we have to presume that these have been adequately cared for and our concern is that the developing process shall not interfere with the excellence of the end result.

(a) Temperature:

It should be noted that the various manufacturers of the chemicals used in the developing process have their own well established recommendations concerning the times and temperatures at which their products will function most efficiently. This information usually appears on the wrapper or the container of their product and in all fairness to them, it should be the execption rather than the rule, to depart from what they suggest.

There are many valid reasons, however, why we should set down for your in-

formation, basic or average figures which are ordinarily applicable to most developing agents used by x-ray technical personnel.

In this regard, then, we may say that it is advisable to use the developing bath at temperatures ranging between 64 and 72 degrees Fahrenheit. While it is true that this range of permissable working temperatures is comparatively limited, it should be noted that it conforms fairly readily to the average room temperature of office and hospital.

If, as sometimes happens, the dark room is located in the far corner of the basement, temperatures may fall far below this desirable range and in such instances, it will be necessary to provide a means of raising the temperature of the solutions to the required level.

This may be accomplished reasonably quickly by means of several methods. Arranged in order of convenience, and hence popularity, are the following:

1. Hot and cold water, under valve control, is fed to the master tank which, in turn, contains the "inserts" or tanks holding the developer and fixer. In the larger hospitals and clinics, the flow of hot and cold water is under thermostatic control so that water of a constant temperature is continually surrounding the inserts, thus keeping the solutions at a pre-determined temperature.

Even without thermostatic control, such an arrangement has great value, and is to be highly recommended.

2. In those cases where hot water does not reach the dark room, electric tank heaters may be used. These are placed into the actual developing tank, and raise the temperature of the solution fairly quickly. They are available from most of the x-ray supply houses at about $15.00.

3. It is also possible to dip out two or three pints of the developer into a clean enamel vessel, and to heat this on cook stove or electric hot plate. The big disadvantage here is that the developer absorbs a certain amount of oxygen every time you do it, and its working life is thus shortened.

At some hospitals, devoid of plumbing as far as the dark room is concerned, 16 ounce medicine bottles are filled with very hot water and by means of a string attached to the bottle, are set into the developing tank. This procedure will raise the temperature several degrees in just a few minutes.

One method to be *avoided* is the addition of hot water to the developer itself. Such a procedure dilutes the developer, and therefore lowers its efficiency.

The developer should always be well stirred before reading the thermometer, especially if only a limited amount of x-ray work is attempted and the solutions remain undisturbed for extended periods of time. Under conditions such as this, there may be a difference of several degrees of heat as between the solution at the top of the tank and the solution at the bottom.

In large hospitals and clinics, as has been noted, the principle of retaining a constant temperature of say 68 degrees is to be commended, and does not ordinarily present a major problem, since every convenience is usually at hand to provide the means. For that very reason, it is difficult to discover any legitimate excuse for the continued neglect of this very important phase of the processing procedure at such hospitals.

So much, for the moment, about temperature control.

(b) Exhaustion of Developer:

Let us consider now the *condition* of the developing solution.

One hears a great deal nowadays about the "replenisher" system of development; a clear indication, if one were needed, that the developer does lose its potency, if it may be called that.

In brief, the principle is to remove a certain amount of the used developer every day and to replace that with an equal amount of replenishing solution, thus keeping the developer at a reasonably constant strength. As might be expected, this procedure provides for standard results over an extended period, and is in great favour at the larger institutions and clinics.

Our present concern, however, is to point up the fact that the average tank of developer, without the addition of any replenisher, can only be expected to change some certain quantity of silver bromide to silver oxide. Having accomplished this, its usefulness to us is finished and it should be discarded.

Attempts to develop exposed x-ray films in old worn out developing solution, lead always to poor results and the consequent loss of diagnostic value of the x-ray film.

When, as sometimes happens, this worn out condition is accompanied by low temperature, persons responsible for technical procedure, not realizing the true cause of such poor quality in the final result, blame the x-ray unit itself, or a failure in power supply, and begin to clamour for service.

As a guide toward the useful life of any known quantity of developing solution, some of the manufacturers will supply charts, suitably prepared with small squares, upon which one may note the number of films processed daily, according to sizes and thus be fully aware as to the amount of work that has already passed through the tank and, consequently, never in doubt as to when to discard same.

A less accurate but very convenient procedure, suitable for use where only a minimum of x-ray work is attempted, is to record against the name of each patient the size and number of films used at each examination and to total these figures monthly.

Correlate these figures with the following information:

Each gallon of developer may be expected to process thirty-two 14″ x 17″s, OR, ninety-six 8″ x 10″s, OR, sixty-four 10″ x 12″s.

Notice that this has been worked out on the basis that three 8″ x 10″s will equal one 14″ x 17″, and that two 10″ x 12″s will also equal one 14″ x 17″.

Assuming, therefore, that the work attempted from day to day requires the use of films of various sizes, and that the major portion of that work is attempted on 8″ x 10″s and 10″ x 12″s, as is so often true, the total amount of permissable work by each gallon of developer might summarize as follows:

Ten 14″ x 17″s, plus thirty-two 8″ x 10″s, plus twenty-one 10″ x 12″s, or a grand total of sixty-three films of all sizes.

Should the developing tank have a capacity of three gallons, then the permissible total would be 189 films of all sizes.

To discover the capacity of your tank, if unknown to you, or if you are in doubt, find the inside measurements in inches. Height, width, depth. Multiply these figures and divide the result by 231. This will give you the capacity in gallons, at 128 ounces to the gallon, a figure which you will note is quoted on the outside of many of the containers of photographic chemicals.

One final comment concering the use of exhausted developer. Even from strictly a dollars and cents point of view, it is rather foolish to spoil films by the use of an old worn-out bath of developer. At current prices, one gallon of developer can be obtained at about the cost of one 14" x 17" film.

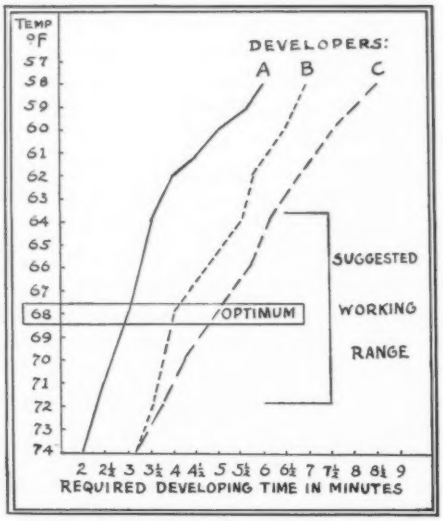
(c) The Time Factor in Development:

The length of time that the film is permitted to remain in the developing bath is inseparably linked with temperature and degree of exhaustion. The optimum working temperature is generally agreed to be 68 degrees Fahrenheit. As the temperature rises above this point, the required developing time lessens, and as the temperature falls, the required developing time increases. Depending upon the brand of the product being used, the relationship between temeprature and time is somewhat as follows:

Temperature	Time in Minutes		
	Brand "A"	Brand "B"	Brand "C"
58	6	7	8½
60	5	6½	7¾
62	4	6	7
64	3½	5½	6¼
66	3¼	4¾	5¾
68	3	4¼	5
70	2¾	3¾	4¼
72	2¼	3½	3¾

When the above figures are placed on a graphic chart and lines extended to illustrate the relationship between temperature and the required time (which see), the importance of trying to retain an average of between 64 and 72 degrees becomes very evident, since no matter what the brand of developer may be, the time factor, within those limits, has a spread of about two minutes.

The chart will also show the average difference in required developing time, as between a temperature of 58 degrees and



Variations between three brands

one of 68 degrees is three minutes; and that when the temperature drops to below 62.5 degrees the required developing time increases at a very rapid rate.

Another factor not generally realized is that at temperatures below 55 degrees, certain otherwise active ingredients of the developing bath form a cloudy precipitate, have no value to us in that condition and are very difficult to re-dissolve.

(d) Exhaustion, Time, Temperature:

Having thus linked the time factor to temperature, we must now tie in this matter of exhaustion, unless of course we happen do be operating on a "replenishing" basis, which is not often true in the smaller hospitals.

It's not such a difficult problem after all. One needs to know the capacity of the developing tanks, and from that, the estimated permissable *total* of films that the solution will properly process. It is presumed also, that we have already set up a scale indicating the time of development for any known temperature.

We may then compensate for partial exhaustion by proceeding as follows:

When approximately one-third of the permissible total of films has been developed, add one-half minute to the stated required time. When two-thirds of the permissible total have been developed, add yet a further half minute.

To illustrate:

Known size of tank—3 gallons.

Permissible total—189 films, of all sizes.

Brand of developer in use typical of that shown in column "B" of table dealing with temperatures.

Temperature	Time in Minutes Fresh Developer	After ⅓ Total	After ⅔
58	7	7½	8
60	6½	7	7½
62	6	6½	7
64	5½	6	6½
66	4¾	5¼	5¾
68	4¼	4¾	5¼
70	3¾	4¼	4¾
72	3½	4	4½
74	3¼	3¾	4¼

Striking evidence of the effect on required developing time as made by temperature and exhaustion is herein set down.

Notice that new developer, at 74 degrees, will fully develop a film at 3¼ minutes, whereas when two-thirds exhausted, and at a temperature of 58 degrees, the required time would be 8 minutes.

A chart similar to the above, prepared from information known to you about the amount of work attempted at your hospital, plus what you know about the brand of developer you are using, should be posted in the dark room for ready reference.

Fixation:

Let us now briefly review what has happened to our film as we have followed its journey through the developing process. It has been exposed to radiation, the photographic effect of which has been made manifest to us by the action of the developing agent. In other words, the emulsion of that film will have darkened over certain parts of its surface because of the effect of the developer on the silver bromide which has been bombarded by Roentgen radiation.

There remains the problem of stopping the action of the developer, making the image so far created a permanent one, and of getting rid of the unaffected silver bromide which, if left on the film, would only serve to confuse us, and perhaps what is worse, *would still react to the action of light.*

All of these desired results are obtained by immersing the film in a chemical bath known as the "fixer."

It is the transparent and semi-transparent areas of the film, created by the dissolving away of the unused silver bromide, combined with the various gradations of darkening due to silver oxide, which present the story told by the radiograph. *Only when the fixing solution has completed its work, does the film lose its sensitivity to light.*

Since the developing bath and the fixing bath have very different functions, and are in fact directly opposed, as it were, one of the principles of good dark room technique is to make every effort to prevent contamination of one bath with the other. Vessels and stirring paddles, used to prepare these solutions, should be kept separate and clearly identified.

One should also avoid, as much as is reasonably possible, the carry-over of developer on the film to the fixing bath. In actual practice, vessels holding these solutions are set into a master tank which is filled with water. One function of this water has already been mentioned, that of temperature control, but it also serves

as a rinse bath, with which to rid the film of most of the developer immediately after the completion of the developing process and before placing the film in the fixing bath. Rinsing need not be prolonged beyond 10 or 15 seconds.

(a) Exhaustion of Fixing Solution:

We have already discussed what was described as a loss of potency by the developing bath, and we have much the same problem to consider in connection with the fixer.

Only a certain amount of unused silver bromide can be dissolved by each gallon of fixing solution, and because of the large amount of work that the fixing bath is required to do, we find in actual practice, thinking about numbers of films, that each gallon of fixer will adequately process less films than will each gallon of developer.

Just for your own satisfaction, study a few radiagraphs, and discover for yourself just how large a proportion of each one is transparent or semi-transparent, and then remember that this is the result of the work done by the fixing bath.

Two methods are in common usage whereby we may judge the activity of the fixing bath, week by week:

1. If it takes longer than three minutes to dissolve away the unused silver bromide, the bath should be discarded. (This may be determined by viewing the film in safelight illumination during the fixing process. The residual patches of silver bromide appear creamy in color.) *Look at the film—not through it.*
2. Proceed in much the same manner as was suggested in connection with the developer, that is to say, establish the capacity of the tank, in gallons, at 128 ounces to the gallon. Do not expect the fixer to adequately process more than 40 films of all sizes, per gallon.

(b) The Time Factor in Fixation:

No great harm can accrue to films that are left in the fixing bath for a few minutes beyond the required time. On the other hand, insufficient fixation will leave the film in a condition which makes for poor keeping quality, a defect which may not make itself evident until the films are two or three years old, by which time it is too late to do anything about it.

Washing:

The next step in correct processing procedure is to thoroughly wash away from the film all traces of the chemical baths used. This is best accomplished in running water, the wash tank being so designed that the water covers not only the film, but also the film hanger by which it is supported during all the preceding stages. Plumbing arrangements should be such as to permit the water to flow into the bottom of the tank on one side, and the overflow to leave the top of the tank on the opposite side.

Where plumbing facilities are available and a separate tank provided for washing only, there is ordinarily no problem and therefore no excuse for insufficient washing. Under conditions such as are indicated, 20 minutes is usually ample.

If the only tank available is the master tank into which are set the developing and fixing tanks, and this is fitted with hot and cold water supply, as it should be, the problem still is not too severe. True enough, the running of cold water for 20 minutes will lower the temperature of the solutions, but the washing may take place during the noon hour, or late in the afternoon, and after the films are removed

from the water one may elevate the temperature of the solutions by running hot water into the master tank.

Under the poorest conditions of all, that is, with a dark room devoid of plumbing, the washing of films becomes so much a problem that it is often neglected entirely.

This is to be regretted. X-ray films are as important a part of the patient's case record as are the graphic chart, nurses' notes, surgical record, et cetera, and as such should be given every reasonable care so that they emerge from the dark room in a condition which will ensure that the information thereon is not only available for immediate adequate interpretation, but also that it will remain in that condition indefinitely.

It should also be noted that it becomes difficult, if not impossible, for either physician or specialist to correctly interpret the story told by the film, if the shadows thereon are obscured by residual chemicals left on the film by improper washing.

In the absence of plumbing, so far as the dark room is concerned, films may remain in the master tank for 15 minutes or so, with frequent "dippings" into the water, and then should be taken to a cold water tap and rinsed thoroughly for a minute or two before hanging them up to dry.

Under conditions such as this last, be sure to change the water in the aster tank fairly frequently because in a day or so it becomes a rather soupy mess and if not discarded, will leave the films in a condition, which, to say the least, will be disappointing.

Testing a Safelight:

It should now be in order for us to return to the subject of safelight illumination and to understand very readily the reasoning behind this suggested experiment.

The object, of course, is to find out whether any harmful effect is being produced on the radiograph by the action of the light from the safelight.

As previously mentioned, all safelights are suspect, and ought not to be taken for granted. Furthermore, all safelight assemblies should be so mounted as to illuminate the whole of the work area, and should *not* be placed immediately adjacent to the developing tank.

Having thus attended to the location of the safelight, you may prove the presence of any harmful effects by proceeding as follows:

1. *In absolute darkness,* load a film, say an 8" x 10", complete with paper folder, into the usual type of non-screen exposure holder. If your hospital does not have this type of holder, you may, for the purposes of this experiment, load film and folder into a cassette.

2. Place this on the x-ray table or other convenient surface, and cover one-half of the film holder or cassette with sheet lead or a film blocker.

3. Subject the unprotected half to an exposure of 5 M.A., 40 kvp., 1/10 sec., at say 25". This procedure will make that half of the film about eight times more susceptible to the action of the safelight, than will be the other half.

4. Return to the darkroom and in *complete darkness,* remove the film from the holder and leaving it still wrapped in its paper folder, lay it on the loading bench at the place where you ordinarily do all the loading and unloading of films and put them in the hangers ready for development.

5. Now turn on the safelight, and fold back about one inch of the black paper folder, thus exposing a strip of film to the action of the safelight. Leave it that way for 30 seconds. Now fold back another inch of black paper, and expose the strip exposed to yet a further 30 seconds. Continue this process, exposing each newly uncovered strip of film for 30 seconds. Leave the last inch or so unexposed as a control.

6. Turn off the safelight and in *complete darkness*, process the film through development, rinsing, and fixation, using the usual routine time periods for each step in the process.

Let us review what has happened to this film in order that we may the more readily understand the story that it will tell us.

One-half has been subjected to the action of Roentgen radiation and may therefore be expected to darken under the action of the developer.

The other half has not been so exposed and therefore, in theory at least, should not so darken.

All of the film with the exception of a small strip which we left as a control, has been subjected to the action of the suspect safelight for periods of 30 seconds, 1 minute, 1½ minutes, 2 minutes, 2½ minutes, and so on.

As a result, therefore, of the processing, this film will show various degrees of "blackening" over most of its surface, the degree being proportionate to the combined effect of radiation and safelight on the one half, and of the safelight alone on the other half.

Inaddition, there will be a small strip which has been protected against the action of both, and therefore should not, in theory at least, change in appearance at all.

Since we know that each section will show the accrued effect of multiples of 30 seconds, it should not be difficult to discover the time period for which the film is comparatively safe from harm.

What is more valuable, you know that your findings apply to conditions as they actually exist in your own dark room. Corrective measures should be taken if these findings indicate that the film is being subjected to an excess of safelight illumination.

Conclusion:

A sincere attempt has been made to bring to your attention some of the more serious hazards as they are known to actually apply to x-ray processing procedures. Not all of the known hazards have been dealt with, only those which, by their effects on the finished product, are known to us as the major causes of the markedly poor results obtaining at many hospitals.

It is the responsibility of all those who attempt x-ray technical procedures to see to it that the x-ray film receives just the correct type and amount of Roentgen radiation to successfully demonstrate the region or organ under examination.

It is a further responsibility to ensure that all other factors which might lower the technical quality of the end result are either prevented, or kept to an absolute minimum.

The dark room is without doubt the source of a large number of these harmful factors, and it is hoped that this paper will assist you to avoid many, if not all of them.

SAN FRANCISCO

The 1949 Convention City of the American Society of X-Ray Technicians

By MARION ATKINSON
Hamilton, Ont.

SAN FRANCISCO! The great wings of our quad-motored plane tilted gracefully, swooping the plane in a great arc (much as the eagle of the U.S. National Emblem itself might have done in flight) out over the Pacific Coast, then inland and there on her seven hills in all the glittering jewel-like splendour of a brilliantly lighted city was San Francisco, nestled at the foot of, and up and down the humps of her mountainous country. No play was ever given as great a stage setting as the glittering panorama before us —the voice of our pilot noting the various points of interest:—Alcatraz, that world-famous prison on its island just westward, looked more like a prince's playground than a place of punishment. Two of the most famous and world's largest bridges span her bay and harbour; the great Bay Bridge, 8¼ miles long, with upper and lower deck, and the magnificent, two-year-old Golden Gate suspension bridge "only" two miles long. Finally the great, long, flare-lit runways of the landing field; a 23 mile ride to the Fairmont Hotel on Nob Hill, the highest point in the city itself, and at last two very tired, but happy people retired for a welcome rest. We had left Malton airport near Toronto at 8.05 a.m., having risen at 5.30 in the morning to be ready for our drive from Hamilton, arriving at the Fairmont about 11.00 p.m. (2.00 a.m. our time). Sweet Dreams!

It was my privilege on this trip to accompany Mrs. Mary F. Cameron, who had been thrice invited by the American Society to present a series of lectures of her own choosing for the June 5-10, 1949 Refresher Course of the American Convention. Mary had spent an arduous winter with long hours of overtime each evening and most of her week-ends in preparation of a 64-page brochure entitled "Structural Studies," consisting of a series of lectures, one to be given each morning for the five days of the Convention. Now the time had come to present and impart this knowledge gleaned from her long experience and winter's research and study to our neighbours to the South. Three hundred copies were printed and shipped by request and at the expense of the American Society for their convention, and I feel they are richer far beyond the monetary outlay for having them in their possession.

Following breakfast Saturday morning the first person to greet us in the lobby of the hotel was Edward J. Wilson, San Franciscan and General Chairman, who had just finished clearing Mary's lecture materials from Customs and promptly guided us around to his car to see them. We rounded the corner and suddenly felt we were on the paved edge of a sheer precipice and promptly clutched each other for support. The car appeared to be resting comfortably on its rear bumper. San Francisco is the only city in the world where you can drive a car lying down. If you do not believe me, go yourself sometime. It is also the only city in the world which has the cable-car service, the cars being pulled by cables constantly moving underground. We helped take the parcels into the hotel baggage clerk via the engine room, where we had a beautiful drink of the coldest spring water from a fountain in the hottest section of the hotel (underground). We went up to our room via the freight elevator, passing the meat shop and kitchens on our way.

That noon on our way down to lunch who should step on the elevator but Miss Ruth McMillan of Los Angeles, Planning Committee member and Co-Ordinator with whom Mary had corresponded. A great exchange of conversation followed, and upon arriving at the Coffee Shop we met Johnny Cahoon of Duke University, North Carolina, who also joined us and a grand time was had by all.

Saturday evening we were taken out to the Balalaika for dinner by Miss Helen Pennal, a charming Canadian friend of Mary's, now a San Franciscan technician in Dr. Williams' private office.

Sunday morning breakfast was at ten at the Cliff House by the sea, a very beautiful place, but we did not attend, being too engrossed in preparation for Mary's Monday lecture. During the morning, however, we register at the busy registration desk with its four attendants, receiving our badges and special ribbons for Refresher Course lecturers and assistants (mine was only an act of courtesy), and purchased our book of luncheon tickets for $28.00, including $5.00 for registration.

The first luncheon was Sunday noon, especially in honour of the Refresher Course members, presided over by Miss Martha Hampel of Denver, Col., at the head table, with Johnny Cahoon and Ruth McMillan on her right, and Mrs. Mary F. Cameron and Dr. L. G. Idstrom, Radiologist of the Swedish Hospital in Minneapolis, on her left. Miss Hampell is a past-president of the A.S.X.T., and proved a very charming and efficient chairman, making introductions so that we not only knew our immediate neighbour, but everyone present. It was a delightful occasion, completely warming our hearts and making us feel at home.

Monday morning found us up at 6.00 to have breakfast and make sure everything was in readiness for Mary's first lecture from 9.15 to 10.15. All lectures must begin and end on time. Mary had the second period which facilitated matters generally for her. There were two refresher course periods with four classes per period each morning, which preceded all other lectures.

Mary's class was the largest on record for these courses, and I wish every Canadian might have been privileged to hear her outstanding delivery of her brilliant subject material, memorized word for word with barely a reference to script, entitled "The Influence of Structure Densities in Radiography." We barely had time to gather all materials used in the lecture up to our room and still arrive in the General Assembly Hall for the official opening, but we made it.

The opening session was at 10.30 and began by all present standing to sing the National Anthem led by opera singer, John Collins, followed by invocation by the Rev. Peter M. Dunne, S.J., University of San Francisco. The session was then called to order by the president, W. R. MacInnes, R.T. Dr. Geiger, Director of Public Health, brought greetings and the welcoming address in place of Mayor Robinson who was unable to be present. This was followed by other greetings and responses. Dr. Geiger called our attention to the scarcity of the American dollar in Europe and to the fact that the scarcity in the U.S.A. was the x-ray technician. Leaving here, we passed through the Exhibit Room and saw some very outstanding displays of radiography.

At 12 noon a beautiful luncheon in honour of the Sister Technicians was enjoyed by a very large representation. Incidentally, the serviings at these luncheons and dinners were fabulous in quantity as well as quality. We learned, after almost having to be carried from the first luncheon table, that the entree dish was not the main course.

Mary had had no time for rehearsal at home, so we took the rest of the day for

our own, despite the fact that we would have liked to benefit by other lectures during the afternoon. There were about five each afternoon.

Tuesday came bright and early for us. Day would begin to break around 3.00 a.m., and the nightly fog chilled the air so that if we awakened at 5.30, which we did this morning, the Sandman seemed to have completely disappeared, so we just naturally got up and went to work. This second lecture was on the "Movement of Structures as Effected by the Mechanics of Respiration" and "Joint Movement and Radiography," and was brilliantly executed by Mary, as were the lectures each day. Directly following this one we managed to see and hear "Anatomy and Radiography of the Femoral Neck," cleverly given by H. O. Mahoney, General Electric Co., Chicago, Ill., and beautifully illustrated by coloured slides and moving pictures which proved very enlightening indeed on one of the more difficult radiographic problems.

The luncheon Tuesday honoured the American Registry of X-Ray Technicians and Guests, and proved most enjoyable and "satisfying." Dr. Kenneth D. A. Allen was the guest speaker.

That evening found us relaxed in the most casual outfit or dress costume to attend California Night—49er party—Aquatic Park. A buffet supper was given by the Picker X-Ray Corporation. We were driven by Miss Lois Spencer, R.T., who was in charge of the transportation committee and who very happily drove us up to Coit Memorial Tower, built in memory of San Franciscan firemen. This structure rises on its hill 540 feet above the bay.

On our way into the buffet supper room moving pictures were taken of each group. These neighbours of our are extremely camera conscious — everywhere we heard the clicking of cameras or saw the glare of twin lights extended at the ends of a transverse rod with the camera between. The supper was magnificent from bologna to turkey with every salad and crisp green, cheeses, pickles and potato chips, wonderful hot rolls, dessert, cokes and coffee. This was followed by excellent entertainment and dancing on the second floor where we witnessed one of the most hilariously funny solo acts I have ever seen, in which the actor sits alone at a small table and portrays every conceivable way of eating doughnuts and coffee; at the end of which both actor and tablecloth are dripping with coffee and not one of the dozen doughnuts is left, even for a souvenir.

Wednesday we skipped the affiliation breakfast but were ahead of time and well prepared for Mary's third and very heavy lecture, "Bone Structure—The Vertebral Column—The Cervical Vertebrae and The Thoracic Vertebrae."

The luncheon to-day was held in the Tonga Room, a very interesting dining room "on board ship" with cocktail bar at one end. The tables are arranged on deck around the railing of a central pool up and down which floats the orchestra platform giving forth Hawaiian music. The lights darken, the lightning flashes and the rain pours down in the pool (from concealed irrigation pipes), and the clouds drift by, back to the bar. Beautiful Hawaiian flowers had been flown in especially for this luncheon and at each place there was the daintiest specimen of orchid. The head table was breath-taking with richly coloured, exotic bloom. I have long since exhausted adjectives for their wonderful food.

In the afternoon we had to choose between a long bus drive over the Bay bridge for a visit to the Cyclotron, University of California, Berkeley, and a Bay Cruise. Having chosen the former we finally arrived at a considerable altitude and, following a brief inspection, were admitted to the inner sanctum. It is a

great circular, barn-like place, complicated with highly specialized machinery, control rooms, and tremendous cement blocks weighing 10 to 20 tons each, safety lights, warning signals and sliding doors automatically controlled for the innermost sanctum sanctorum. When finally we emerged from this maze of electrical ingenuity, feeling somewhat electrified and even more mystified, we were glad to feel terra firma under our feet once more and see the blue sky overhead, spreading warmth of the sun, and to know that there is an Infinite Being, more merciful that this mysterious, gigantic machine, if it should ever "get out of hand."

Thursday was a big day! Mary's fourth lecture, "The Lumbar Vertebrae, Sacro-Iliac and Lumbo-Sacral Joints," was excellently presented as usual, with demonstrations and illustrations. Much interest was aroused, and many questions were asked, so that there was not nearly enough time for general discussion. Today's luncheon was given by the Texans, honouring counsellors. All counsellors sat at the head table and each one was introduced and asked to say a few words. There were representatives from the Yukon to the deep South, and from the East to the West.

At 1.30 we attended the Jerman Memorial Lecture given this year by Dr. Darman A. Rhinehart, Little Rock, Arkansas. "This Factor Called Voltage" proved an instructive, interesting and enjoyable presentation. Dr. Rhinehart was prepresented with a gold necklace circled with gold medallions, some of which were already engraved with the names and year of those who had given a Jerman Memorial Lecture. Also each previous Memorial Lecturer (including one well known to Canadians, Mr. H. O. Mahoney) was seated on the speakers' platform, and presented with a gold medal. It was inspiring and exceedingly nice to see the efforts of those who had worked long and hard recognized and rewarded even in one particular niche of a vast field.

The coktail hour at six o'clock, sponsored by the radiologists of the Bay Area, was a delightful occasion preceding the annual banquet. The large Gold Ballroom was filled and the dinner sumptuous. The central outer part of the head table was a cascade of the largest gladioli I have ever seen. Two Hawaiian boys encouraged our relaxed enjoyment of an expertly served dinner with truly beautiful dinner music on violin and piano. The trumpeting in of the dessert and coffee was unforgettable. The waiters filed in wheeling carts, the first of which was a shower of gladioli, and carrying great trays covered with tall slender stemmed glasses of ice cream. The new President for 1949-50 was made known in the person of Miss Erminda R. Clarke, R.T., of Bryan Memorial Hospital, Lincoln, Nebraska. Dr. Cyril J. Attwood, Oakland, California, gave a very encouraging address, lauding the merits of the x-ray technician. Everyone had fun at the dance.

On Friday Mary gave her fifth and last lecture, "The Soft Tissue Structures," under the headings, "(a) Research and the Tissues Themselves," "(b) Applied Techniques," "(c) Placentography." At the end of the series comment cards were handed in by the members of each class, and I was indeed thrilled and happy for Mary, because they proved beyond a doubt that her efforts had been worthwhile. Her classes were for advanced technicians and had been well attended by educators. Their comments and high praise really counted for something and won for Mary an immediate invitation for next year.

Our final luncheon was a beautiful affair honouring convention committees. We had to leave early because a lovely drive had been arranged for us at 1.30 with the General Manager of the General Electric Company. Mr. Hitchcock proved

a very congenial host and we drove for hours, passing over the beautiful Golden Gate bridge, through the hills of Marine, Palo Alto, and completely circling the Bay on the opposite shore to the highest point, giving us an unobstructed view of San Francisco in the brilliant California sunshine; finally approaching the bridge from the opposite side and visiting the Golden Gate Park, beautiful beyond description, covering thousands of acres completely man-made, including a lovely Japanese garden.

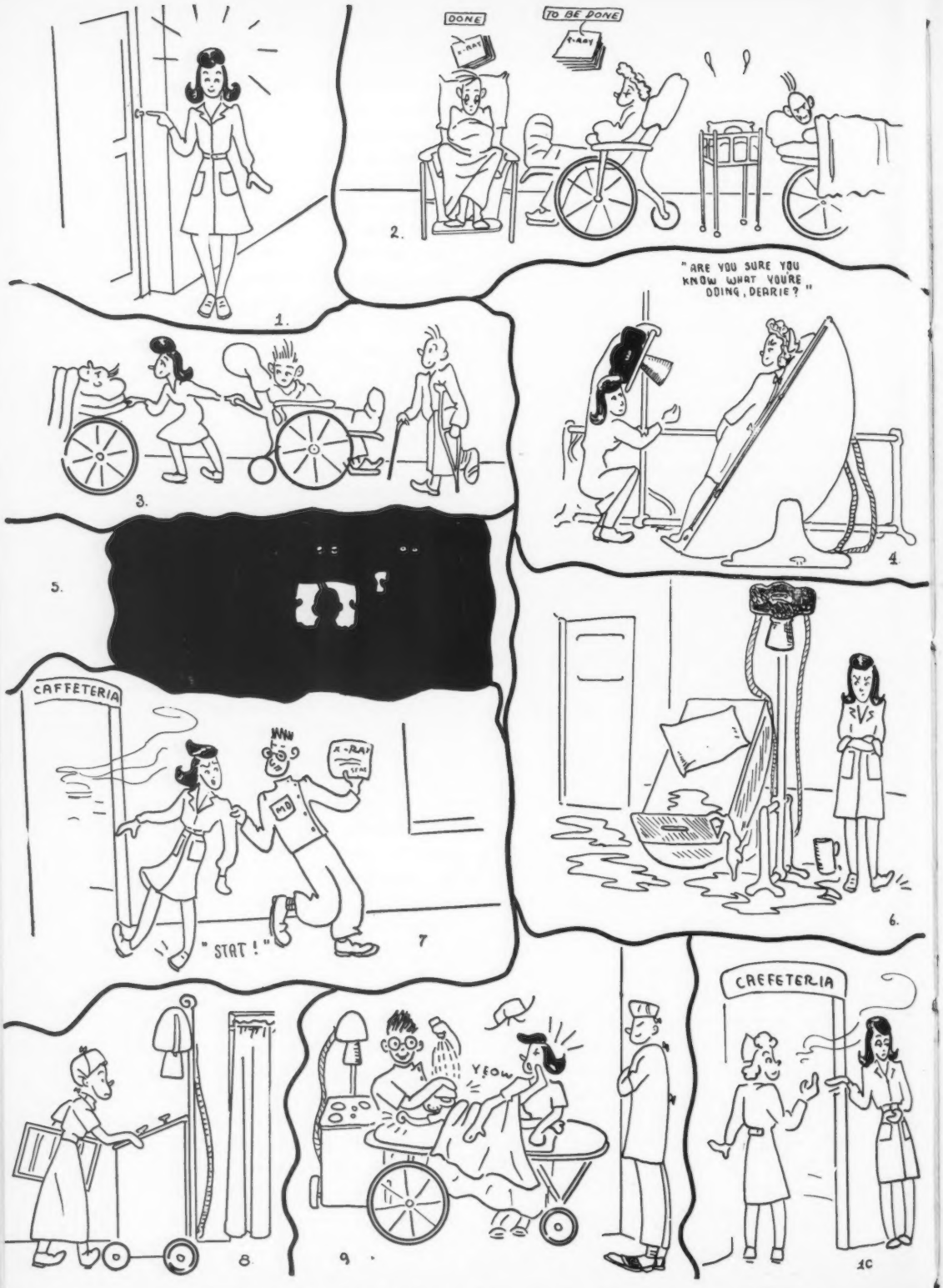
Before I leave the convention too far behind I would like to express the heartfelt thanks and appreciation of both Mary and myself for the courtesy and kindnesses extended to us on all sides during the convention and after. The A.S.X.T. committee members are dynamos of efficiency and everything begins and ends on time. Nothing is too much trouble and wherever possible one's every need and wishes are anticipated. Their educational programme is tremendous in its scope and concentration and the keynote of the entire convention was the comfort of the patient.

The ground covered in these five days would comfortably cover almost as many weeks. We take our hats off to you, A.S.X.T., you really know how!

Friday evening found the new President with several others in our room exchanging notes on a most successful convention. Saturday really saw the exodus of the executive members, but fifteen of them found their way to our room before departing and we all had lunch there together. Conversation was highly intelligent, inspiring and enlightening, punctuated with laughter and nonsense.

By Sunday, work behind us, we were all set to enjoy a few days of freedom. We were taken to the Palace Hotel for dinner, where you seem to sit in a garden of palms and ferns rather than a dining room; to Rickeys where you serve your own entree plate, hardly knowing where to begin or end over the lavish display of appetizers; to the House of the Prime Rib Roast where the Chromium Cabinet is wheeled up to your table, the Chef serving your plate right at your elbow from whatever cut you choose; to the Olympic Club, a beautiful golf course high up, with a membership of eleven thousand, overlooking San Fransisco in the distance. We were given tickets to see Cabalgata, an extravagant Spanish musical, the first American appearance following eight years of European theatres. We could not miss the touch of the Orient —we went to Chinatown with a population of 20,000; to Fisherman's Wharf, an artist's paradise for boats and atmosphere. We were taken for another beautiful 100 mile drive through Southern California, visiting Stanford University. We shopped; bought delightful corsages at the colourful flower stands; rode the unique cable cars where they are turned by hand on a turn-table in the heart of the city and pushed up the track for contact again by the backs of the passengers as well as the conductor and morotman. If time and space would permit, I would like to describe fully the beauties of the Fairmont Hotel with its European Lobby, palatial in design and structure with its three basement levels and six stories above, taking in a large square block on a seventy-degree angle slope. Its various shops provide almost every requirement and its dining rooms and cocktail bars every entertainment.. It has its own theatre, with a seating capacity of 200; but cross the street and go to the top of the Mark Hopkins Hotel for your night view—it is the tallest building on the highest hill.

Farewell, San Francisco, your courtesy is as warm as your California sunshine! Thank you for enriching our lives; for having shared your beauty, charm and sincerity of purpose.



 Drawn by E. A. Lochner, B.Sc., R.T., Dayton, Ohio.

A DAY IN THE LIFE OF C

THE END OF A PERFECT DAY!

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A Technic for True A.P. and Lateral Projections in Shoulder Injuries

By PATRICIA LAVALLEE, R.T.
St. Boniface Hospital, St. Boniface, Man.

IT IS a well-established rule of radiography that two projections or views at right angles to each other should always be made. This is necessary because a single film gives a two-dimensional picture only. For the third dimension, so important especially in fracture work, another projection at right angles to the first is required.

For most parts of the skeleton this rule is readily applied. The shoulder, however, has been an exception. It was generally considered that satisfactory lateral views could not be obtained in this region and an acceptable substitute has been the use of steroscopic pairs of films in the A.P. position.

The difficulty of obtaining a lateral view of the shoulder can be traced to the practice of radiographing this region with the patient lying on a table. In the supine position it is a simple matter to make an A.P. projection and, furthermore, the patient is not subjected to much discomfort. On the other hand, attempting any sort of a lateral view on the table is very distressing, especially in injury cases in which this view would be most desirable.

It occured to us that it might be more more comfortable for the patient if the examination was done in the erect position. Probably more important, however, was the realization that because of its mobility the position of the shoulder does not always coincide with that of the trunk; for example, with the patient lying on the table the upper end of the humerus may be seen as an A.P. or lateral projection, depending on whether the arm is externally or internally rotated.

Thus it cannot be assumed, because the patient is in the supine or A.P. position that the humerus is also A.P. It was therefore decided to think of the shoulder independently of the rest of the trunk. This meant that some landmark would have to be found which would indicate accurately the position of the shoulder relative to the film.

It is well known that when the elbow is flexed to a right angle, the forearm is perpendicular to the anterior surface of the humerus. We therefore selected the flexed forearm as our indicator.

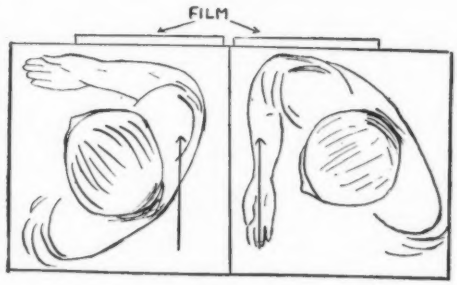


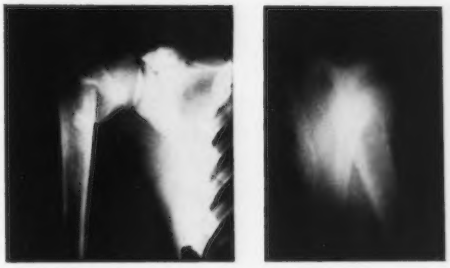
FIGURE 1—
(a) True lateral view of shoulder—see also Fig. 2b.
(b) True A.P. view of shoulder—see also Fig. 2a.

For the A.P. projection the patient is positioned with the back against an upright Bucky. The elbow is flexed (it is often already flexed in a sling when the patient arrives). The patient is then positioned so that the forearm is in line with the central beam and will therefore be perpendicular to the film. The tube is raised so that the central beam is at a level about two inches below the top of

the shoulder (Fig. 1b), with the patient so positioned it doesn't matter whether the trunk is A.P. or oblique as it is the shoulder alone with which we are concerned. The kilovoltage to be selected will depend on the thickness of the patient.

For the lateral view the patient is turned 90° to the left or right, depending on which shoulder it being examined. (Fig. 1a). It will be noted that the flexed forearm is now parallel to the film. As the humerus and shoulder have not changed their relationship to the forearm it naturally follows that the shoulder will be seen in the lateral projection, i.e., at 90° to the A.P. The tip of the shoulder is placed so as to coincide with the centre line of the Bucky and the central beam is directed to a point two inches below the tip. As in the A.P. view the exact position of the trunk is not important as we have primarily positioned the shoulder.

What are the indications for the use of this technique? For ordinary routine purposes there seems to be no reason for replacing the present technique of A.P. stereoscopic films with the palm upwards and an additional A.P. view with the arms internally rotated.



A B

FIGURE 2—Fracture of surgical neck of humerus.
(a) A.P. view. Displacement of fragments clearly shown.
(b) Lateral view. Very little displacement of fragments. Note scapula.

The views described in this paper are probably of most value in cases of shoulder injury where fractions or dislocations are suspected. In such cases manipulation of the shoulder is painful and may even be dangerous. This technique has the advantage of requiring no manipulation of the shoulder and is therefore painless.

It also has an advantage over the so-called "lateral" view through the body because the surgeon can be assured that the films are true A.P. and lateral. Fig. 2 ilustrates how well the position of fracture fragments may be demonstrated.

Requiescat in Pace

We regret to record the death of Dr. A. Comtois, a member of the Board of Examiners of the C.S.R.T., and particularly well known and beloved by our Quebec members whose activities he was always ready to support with encouragement and active assistance. His passing is a source of deep sorrow to all who were privileged to know him.

Radium Production and Applications

By J. D. NESTERENKO

Chief Chemist, X-Ray & Radium Industries, Toronto, Ont.

RADIUM is a subject which undoubtedly spurs the imagination. The discovery of a Radium and Uranium deposit at Great Bear Lake, N.W.T., in 1930, and the following development of the mining and refining of this deposit have created more interest than any other mining discovery in Canada. The reasons are that this deposit was located in a remote little-known part of the American Continent and that Radium is probably the most romantic of all natural elements.

With the recent development of nuclear fission, its associate, Uranium has now become more prominent with the effects that Atomic Energy is going to bring in the political, social and economic conditions of the whole world in the not too far future.

Radium was discovered in 1898 and brought with it the development of an international industry for the practical production of the element. The conditions of the discovery are well known and in a miserable little shed which stood in the yard of a school of chemistry in Paris, Pierre and Marie Curie were able to make the outstanding chemical discovery of all time in spite of the lack of money and equipment. Two more years were necessary for the actual isolation of the element in sufficient quantity and during the next few years radium was only used for scientific experiments by physicists and chemists. Practical use started in 1904, when, for the first time, Dr. Lanlos, in France, treated a cancer of the skin with Radium. Treatment of other types of cancer soon followed and Radium became a commercial commodity which had to be produced in quantities sufficient to meet the medical demand. This was the beginning of the Radium industry.

In nature, Radium is found only associated with the Uranium minerals and the proportion Radium to Uranium in each mineral is constant, varying according to the age of the mineral. The richest mineral is high grade pitchblende, a black oxide of Uranium, with a ratio of about 1 gram of Radium to 4 tons of Uranium Oxide. High grade pitchblende is not plentiful and in 1898, only 2 properties in the world were mined for Uranium: one in Bohemia and the other, a small mine in Cornwall, England. During the few years following the discovery, the Bohemian mine was the main supply and intensive prospecting started everywhere for locating other sources. Between 1900 and 1930, many deposits were found; unfortunately most of them were not of commercial importance or were of a too low grade to be operated economically. Large low-grade deposits exist in the United States, in Portugal and in Russia. During the last 50 years, only two high-grade deposits were found: in 1915 the African deposit in the Belgian Congo, and in 1930 the Canadian deposit at Great Bear Lake, N.W.T. The Belgian deposit is by far the best ever found, both for quality and quantity. With the present active prospecting for Uranium with the help of special equipment like the Geiger-Mueller, other deposits will probably be located and only future work will tell whether any will turn out to be of comparable importance to the present ones. Low-grade ores will probably be the main supply owing to their abundance and to their easy detection and mining. High-grade pitchblende is one of the oldest

minerals, about 1500 millions years old, and occurs only in the early geological formation, the precambrian shield. The best chances of finding it are in parts of the precambrian where nobody has prospected before, like the polar regions.

The French were the pioneers of the Radium industry, due to the fact that the discovery was made in Paris and that most of the technicians were trained by the Curies. No Radium deposit exists in France and suitable ores to feed the French refineries had to be purchased abroad. Production was active until 1914, when the war conditions in Europe closed the refineries. The United States, then, instead of selling their low-grade ores to France, started to refine them and were the main producers until 1922, when the Belgian product appeared on the market at a lower price. The Belgian deposit was of such high grade that competition was impossible and soon all other refineries had to suspend operations. In 1922, about 15 refineries were in operation in various countries and had produced altogether about 150 grams of Radium. In 1930, the Belgian refinery was the main supplier and a small refinery in Czechoslovakia, operated by the government, was the only other producer. The price of Radium in the meantime had been reduced from $160,000 per gram in 1914, to $120,000 in 1920, to $70,000 in 1924. With the discovery of the high-grade in the Congo and in Canada, the production of Radium was considerably accelerated and the price has finally settled down to the present value of about $20,000 per gram. Although no statements of production are available, it is possible to estimate a total production of Radium since the discovery of about three and one-half pounds, of which about one-tenth has disappeared in uses other than medical, the rest being distributed among the medical and scientific institutions of the world or stored in the stock-room of the refiners.

The commercial history has, therefore, been a succession of monopolies: First the French, then the American and last the Belgian, dominating the entire industry. The effect of the Canadian production has been to bring some competition, resulting in the drop of price to the present level, but still leaving the Belgians the prevailing factor.

Refining of Radium involves also production of Uranium in form of salts of metal. Use of Uranium, until the Atomic development, was exclusively as a coloring pigment for the glass and ceramic industries. Use as a ferro-alloy for special steel has never been of any importance. Marketing of Uranium was limited to a world consumption of about 300,000 pounds yearly and there was always an excess of production. The problem has changed completely and at present Uranium has become the main object of refining and Radium is only a by-product. Uranium is no longer available for pre-war users and in Canada, its refining and marketing are entirely under government control.

Mining of pitchblende is done in the same manner as a narrow high-grade vein of gold or other metallic ores. The pitchblende occurs either in small veinlets of solid black mineral or in stringers, generally from one quarter to a few inches wide. The grade brought to the surface runs from one-half to one per cent Uranium Oxide and has to be concentrated mechanically in a mill, using the high specific gravity of pitchblende, about 7, to separate it from the lighter quartz material filling the rest of the vein.

Jigs, shaking tables, water classifiers and other suitable milling equipment are

used to produce a grade running from 10 to 35% Uranium Oxide which is delivered to the refinery for extraction of the Radium and Uranium contained. This concentrate, besides pitchblende, carries a complex mixture of all other heavy minerals of lead, copper, iron, nickel, cobalt, arsenic, sulfur, associated with the pitchblende. If the content of sulfur and arsenic is high, the concentrate has to be roasted in a furnace at high temperature to drive out these elements which have proved detrimental in the refining operations.

A refinery has to be located close to a source of good clear water and to an economic supply of four main chemicals, sulfuric and hydrochloric acid, soda ash and caustic soda. The refining of one ton of pitchblende requires about seven tons of chemicals, mostly the four just mentioned. Refining follows a method in practice since the discovery of Radium and consists of two stages:

1—A Plant Treatment:

To separate first and recover the Uranium and to concentrate the Radium in form of a Radium-Barium sulfate. Radium and Barium have similar chemical properties and the minute quantities of Radium are occluded and carried by the Barium during the various operations. If Barium is not present in sufficient quantity in the pitchblende, some must be added at the start.

2—A Laboratory Treatment:

Of the sulfate concentrate to separate the Radium from the Barium.

The plant treatment varies slightly according to the analytical content of the ore. There is no way of taking out the Radium from the ore where only *1 part of Radium exists in 10 millions or mort parts of ore* and therefore, the ore has to be taken away from the Radium and the Barium. Lack of bulk is the main handicap and the very small amount of Radium has a tendency to leak away with the other elements. This is taken care of by addition of Barium to bring the ratio of Radium-Barium to about 1 part in 500,000. The refining eliminates at every stage elements other than Barium to obtain finally the Barium with the Radium in its custody. The laboratory treatment follows everywhere the procedure established by the Curies during the original discovery work. The insoluble sulfate concentrate of Radium-Barium is transformed into chloride or bromide soluble in water, which being submitted to repeated fractional crystallizations gives a separation of the less soluble radium salt in the head crystals from the more soluble barium salts in the tail liquors. About twenty-five repeated crystallizations on the bromide are necessary to obtain the radium bromide at the commercial purity of 9 parts of radium to 1 part of barium. Higher concentration is seldom needed. The final salt is a white crystalline powder, which is dried, transferred and sealed in a glass tube about the size of a match and containing up to one fifth of a gram of radium. The salt is self-luminescent in the dark room at the beginning but loses most of its luminosity after a few weeks. Also the salt changes color very rapidly and in a few days turns into a brown color with a deep discoloration of the glass container.

The recovery and the handling of the finished radium is highly specialized and the technique employed has developed from bitter experience. Its problems are special, arising from the small quantity of the product, from its extraordinary value and from the risks to the health of the operators. Losses of the product are

controlled by repeated check measurements during the recovery and any loss can be re-collected in form of sulfate. All the operations on finished radium are performed in closed glass cages with appertures to admit the arms and hands, over large trays of glass or enamel where any accidental losses can be collected. The dangers of handling finished radium have been demonstrated by losses of fingers, hands and even life suffered by the early operators. Inhalation of radium dust, breathing radium emanation and exposure to radiations are dangerous. Distance and time are the main safety factors. Handling must be carried out during the minimum time possible and distance can be overcome by using lead screens to cut off most of the radiations. Other necessary precautions include wearing of respirator masks, of rubber gloves and efficient ventilation of the working rooms. All the staff engaged in mining and refining pitchblende, and in other radium handling concerns are under medical supervision, including a pre-employment medical examination, blood tests and medical check-ups taken at regular intervals. Working hours are limited to 35 or 40 hours weekly (5 days) with one week off every 4 months in addition to the normal 2 weeks vacation in the summer. Cancer of the lungs and pernicious anemia are the usual effects on the organism of dust inhalation and over-exposure to radiations.

Refining of Uranium does not present any more difficulty than refining other metallic elements. After separating the Uranium in an acid solution by leaching the pitchblende with acid and filtering, the solution is treated with an excess of sodium carbonate in which Uranium alone is soluble. Uranium can be separated from this solution into whichever form is intended; at present the black oxide which is delivered to the Atomic plants for further refining into pure Uranium metal or pure Uranium fluoride. Radium has a half-life of about 1600 years, meaning that 50% of the product disintegrates itself in each period of 1600 years. It emits a constant production of radium emanation or radon, which is the only metallic element existing in gaseous form. The products generated by the radium disintegration are as follows: Radon, Ra A, B, C, D, F, G. All these products are metallic elements, each with its own atomic weight, chemical properties, radiations and half life. All of them exist only in such small quantity as to be practically invisible to the naked eye. Radium G, the end of the series, is an isotope of ordinary lead and is no longer radioactive. The only products of disintegration with practical use are the radon, the Radium D and the Radium F (also called Polonium by Madame Curie who was Polish-born).

The activities of X-Ray and Radium Industries are mainly in the commercial uses of Radium and in the recovery of radium from waste or old radium containers. The main utilizations of radium are medical and industrial. For medical applications, radium is used exclusively in form of insoluble sufateen closed in platinum, monel or silver containers; these containers are supplied by precious metals refiners and made according to the specifications of the medical profession. The radium content of these containers varies from 0.6 milligram to 100 milligrams. The American type uses a single container, the European type uses a double container consisting of one metallic cell holding the radium surfate and outer container holding the cell. Both containers are hermetically sealed with gold solder at high temperature. The advantage of

the European practice is that the double seal gives less risk of a leakage of radium emanation and also allows an easier recovery of the cell when the container becomes obsolete or damaged. These containers are in a form of needle with a sharp point at one end for embedding the needle in the tumor and in a form of tube which is round at both ends. Needles are used to hold radium up to about 12.5 milligrams and tubes to hold 10 milligrams and over. Both tube and needle have at one end a small eyelet to pass a platinum wire to extract the container from the tumor when treatment is ended. For dermatology, radium in sulfate form is spread over a small metallic plaque of about 1 centimeter square after mixing the radium sulfate with silver-powder, heating and rolling. These plaques can be brought to direct contact with the skin. Containers with 50 milligrams of radium in sulfate form have been used with success for the last 5 years for insertion in the nose during a short period for curing deafness and growth in the channels of the nose and ears. Radium also in sulfate form in large quantity, up to 8 grams has also been used in the form of a bomb holding a large number of 100 milligrams containers placed like the spokes of a wheel inside an outer container. One such bomb of 4 grams have been successfully in use at the Toronto General Hospital for the last 15 years and a few others are being used in Europe and in the States. Radium emanation is also used in cancer treatment, being extracted when needed from a special apparatus holding a stored quantity of radium salt in solution under vacuum. The gas after purification is enclosed in seeds made of glass or gold which are placed directly into the tumor. Radium emanation is also very soluble in olive oil and lanolin and is used in form of an ointment which has proved itself favorable for treatment of x-ray burns and other burns and of arthritis and of non-malignant ulcers. Radium emanation in olive oil is also used to make ordinary bath water radioactive or enclosed in gelatin capsules for complimenting treatment of the cancer of the uterus.

Industrial applications are as follows:

1—Manufacture of Luminous Compounds for Painting Applications:

These compounds are using as a base phosphorescent or fluorescent zinc sulphide which is impregnated in wet form with radium sulfate. After drying, the sulphide is mixed with a suitable adhesive for getting the wet paint to stick to the object to be painted. Radium content per gram of sulphide varies from 5 micrograms to 125 micrograms and luminosity will last for several years.

2—Radiography of Metallic Castings:

For this purpose, the radium sulphate is enclosed in a silver capsule sealed with silver solder containing each from 25 to 500 milligrams. The castings to be radiographed are interposed between the radium capsule and an x-ray film, the time of exposure depending on the thickness of the metal and the quantity of radium. The gamma radiation going through the metal produces on the film a radiograph of the inside, disclosing any flaw, air holes or crack in the inner metal.

3—Preparation of Neutron Sources:

These sources are prepared by mixing radium bromide in solution with a finely ground pure beryllium metal in proportion of 1 part radium to 3 to 10 parts of beryllium. After drying and grinding, the mixture is enclosed in a sealed brass or monel cylinder. Under the bombard-

ment of the alpha radiation, Beryllium is disintegrated into carbon, emitting a constant flow of penetrating neutrons which are needed for physics laboratory research and to supply the neutron emission required to start the Uranium piles during nuclear fission of Uranium.

4—Preparation of Static Eliminators:

Static conditions in industrial plants can be overcome by bringing in the vicinity a radioactive matter giving an ionization of the surrounding atmosphere and destroying the static charges. Radium, for this use, is plated on a thin piece of brass or nickel and the very thin plating of radium is itself covered by a gold plating of about 1 micron thickness. However, Polonium which is about 5000 times more radioactive than Radium is a better product for this purpose as Polonium is easy to extract, is cheaper than radium and does not present any risk of deep gamma radiation as with the radium. The main disadvantage is the short half-life of Polonium, 136 days, requiring recharging of the eliminators every year.

Measurement of radium in any form is made by comparison with a known quantity of radium as a standard. Two methods can be used for measurements; one by using a Geiger-Mueller measuring the penetrating radiation, the other by extracting the radium emanation and measuring the electric current of the ionized air in a calibrated chamber. These measurements are only correct to a fraction of 1 per cent.

Two "Hobby Corner" Personals

The last two issues of *The Canadian Hospital*—June and July, 1949—have featured in their "Hobby Corner" biographies of two peopls well known to Focal Spot readers. The June issue dealt with the marksmanship of Dr. Desmond T. Burke, relating how he won for Canada the King's Gold Medal at Bisley in 1924, being the youngest competitor ever to capture the trophy and also the only one to win the first and final stages in the same year. For the next eight years he took most of the major prizes at Bisley and, as a matter of fact, Dr. Burke has maintained his position as a crack shot ever since, winning a place on the Canadian rifle team to Bisley in 1949. Dr. Burke has written a book on scientific marksmanship, *"The Practical Rifleman's Guide,"* and also contributed many articles on rifle shooting to Canadian and British publications.

The July issue recounts the hobbies of Mr. Percy Ghent. A snap of Lake Louise with Mr. Ghent in a corner of the foreground shows Percy, as he puts it with characteristic modesty, "getting out of the way of the glorious background of Lake Louise." The article tells of Percy's interest in the collection of literary and historical Canadiana, of his love of gardening, of the interesting collection of novel radiographs of everything from dinosaurs to seed pods which our members have been privileged to see on several occasions. The article continues with mention that Mr. Ghent is the author of *A Brief Biography of Roentgen,* a book on Autograph Collecting, Editor of the C.I.L. *News Letter,* has a column three times a week in the *Toronto Telegram* and was Editor of *The Ontario Radiographer* till it was absorbed in *The Focal Spot.* It omitted to mention his latest venture as a dramatist!

Radiography at Sea

By J. L. WELCH, R.T.
Col. Belcher Hospital, Calgary, Alta.

EARLY this Spring the Navy announced that the East and West Coast Canadian Fleets would be combining with the British Home Fleet, the British West Indies Fleet and part of the American Fleet in Spring manoeuvres in the vicinity of the Caribbean Sea.

Having always had a desire to visit that particular part of the world, and the thought of basking in tropical sunshine while Calgarians were still shovelling snow, enthused me (probably more than my patriotic obligations) to convince the local Naval authorities that a Radiographer must be needed on such a large scale defence programme. Consequently, through a minimum of red tape and the co-operation of the D.V.A., I found myself drafted to Canada's principal naval vessel, the aircraft carrier *H.M.C.S. Magnificent*, disrespectfully referred to by Canadian matelots as the "Maggie."

Arriving in Halifax a day prior to sailing date, I inquired (in my complete ignorance of big ships) about the type of equipment I would be expected to operate. The replies I received were, to say the least, discouraging. Yes, there was an x-ray unit aboard which had not been used to its best advantage; mainly because there was no alternating current to supply it and secondly that during its last rather rough crossing from the other side it had fallen over on its vulnerable tube head, and was now in the Royal Canadian Naval Hospital having a complete check over prior to being reinstated aboard the "Maggie," with a promise that it would have a more active life and receive better treatment.

Arriving aboard to take stock of what accessory equipment was at my disposal once again put me in a temporary state of panic. There were two 14 x 17 cassettes, four 10 x 12 hangers, and a box of outdated 8 x 10 film, a broken thermometer, and a promise that the interval timer borrowed by the photographic department would be stolen back.

All this was not, as it may seem, because of inefficiency on the part of the Sick Bay personnel, but merely the fact that no allowance for x-ray equipment had been made up until that time. However, during the afternoon, prior to weighing anchor, the electricians finished wiring in the 110 alternating current and the plumbers installed a processing tank with two 3 gallon inserts. I spent the afternoon gathering together everything I thought I might require for the coming voyage.

The following morning we sailed out of Halifax harbour with far-off Colon our next port of call and my next chance to pick up anything I had forgotten.

The Sick Bay aboard the *Magnificent* is designed to provide complete medical services for a crew of from 900-1,000 men and is actually comparable to a small hospital with its 14 beds, and isolation ward, operating theatre, laboratory and treatment room, besides the Medical Officer's examining room.

We had a medical staff of ten, including three Medical Officers, an O.R. and Laboratory technician, and for this trip an X-ray technician. This may sound like a large staff to care for a thousand men who are supposedly in first class physical

condition; however, it is amazing the number of casualties in the nature of fractured extremities, lacerations and burns, not to mention the usual colds and chest conditions and the occasional epidemics of dysentry and lead swingers that are peculiar to men confined to close quarters on the high seas, so none of the medical staff found themselves as passengers on a southern cruise.

The x-ray unit, a 30 M.A. field unit, for which I developed a great deal of respect, was set up in the operating theatre. The Potter Bucky diaphragm (which was of a very early vintage) served its purpose quite well when placed on the operating table. This, however, gave me only about 25 inch focal film distance and I eventually did most of the cases requiring the Bucky with a few pillows, the Bucky and the patient flat on the deck.

The major problem of radiography at sea is the movement factor. Not only the movement of the patient, but of the cassette, table and the machine itself. As may be realized, every moveable object aboard a ship must be secured firmly to either the deck or the bulkheads to prevent damage in rough weather. In the O.R., the x-ray unit, having the highest price on its head, was given primary consideration and supplied with heavy iron bracings to which it could be bolted against the bulkhead. To the x-ray unit was lashed almost everything in the room; the O.R. table, anaesthetic machine, suction machine and surgeons' stools. This lashing and unlashing procedure took place each time an x-ray was required.

As available space for a dark room was at a minimum, the processing tanks were installed in the already overcrowded medical store room. A gooseneck lamp with a ruby bulb provided the safety light and rocked back and forth with each roll of the ship. Loading and unloading of the cassettes was done on the only available place, the deck. This provided plenty of exercise as I attempted to keep the elusive cassette from sliding around while removing a film from the carton.

Time and temperature processing was thrown out the port-hole, the only similarity was the fact that the further south we got, the less time required to develop a film. On cool days I managed to keep the solutions down to around eighty. My biggest headache with the two solutions was keeping them separated; when the ship rolled to port, the developer splashed over the rinse water into the fixer, and the fixer would throw it back on the return trip. Occasionally, the ship would change course suddenly and the solutions would pour over the side of the tank like a waterfall.

Because of these unavoidable conditions, it was practically impossible to produce a radiograph of excellent diagnostic quality. However, it was far more satisfying to emerge from each struggle with a reasonably good film under those difficulties that it would have been with all possible conveniences.

Over a period of about five weeks, I took approximately 130 x-rays, which in most departments ashore would comprise only a couple of days' cases. Each case at sea, however, is quite an undertaking, after which you feel you have justified your existence for a few hours at least.

As this cruise was not organized to take me on a holiday, I found a good many of my hours from sunrise to sunset were spent at first-aid stations on the flight deck, and having no previous knowledge of the tremendous amount of activity on

an Aircraft Carrier, found it all very fascinating.

How successful the Navy considered this Spring Cruise, I do not know, but it appeared to me with all the manoeuvres, night engagements, attacks, and counter-attacks, submarine and air encounters, early breakfasts and late suppers, they should have accomplished something!

Off-duty hours at sea were never dull for the want of something to do. Sports of all kinds were carried out in the spacious hangars, and when not in use, the huge flat flight deck provided a playground equal to any large playing field. Deck hockey and volley ball seemed to be the most popular sports, although I recall seeing a golf enthusiast practising his putting in a corner of hangar B.

Moving pictures and concerts by the ship's band made many of the stifling hot evenings at sea quite enjoyable. A two-hour ship's concert proved the members of the crew to be quite a talented lot.

On the return trip we held a colossal circus and midway on the flight deck, complete with games of chance, side-shows, hamburger and lemonade stands (run by the officers). The long lines of stalls were constructed with painstaking care and covered with the colourful navy pennants and flags. Listening to the strains of circus music and midway "barkers" made it hard to believe we were miles at sea and not at a familiar local fair. The Sick Berth staff ran the base-ball throwing concession but were forced to close down early in the evening when the last of the home-made balls had gone over the side!

There was little to be desired in making the ship a self-sustained community. A beautiful chapel where the padres conducted their Sunday services. A barber shop, "barber pole" and all. The library offered an excellent selection of books and the laundry kept our clothes clean.

Our few ports of call took us to such places as Colon, Panama, where I saw palm trees and had a ten cent rum and coke for the first time. St. Johns, Antigua, one of the British West Indies islands, where the poverty-ridden natives rowed out to the ship on little rafts and skiffs to trade beads and native wares for food and clothing. Before we left Antigua, the natives were trading pints of "the cup that cheers" for a pair of pants or a jacket and half the population were dressed as Canadian seamen.

In Guantanamo Bay, Cuba, we visited the American Naval Base which would pass for a millionaire's summer resort. The landing of the liberty boats with around three thousand white clad sailors bent on making the best of a short "run on shore" could be compared to the Normandy invasion. There we took a train trip to the City of Guantanamo where the Government is changed overnight every so often by merely having a revolution.

Hamilton, Bermuda, was our last stop on the way back and if not the most lively, certainly the most beautiful city I have ever seen. I attempted to contact the technicians at the hospital, but was informed that they only took x-rays three days a week and that was not one of them. Had there been a vacancy that would have terminated my trip.

Arriving back in Halifax, I said goodbye to the boys on the "Maggie" and spent the long train trip home thinking back on the memorable trip and wondering whether a technician's life at seat wasn't a pretty good number after all.

Excerpts from The Rhyming Radiographer

A Comedy in One Act
By PERCY GHENT, R.T.
Toronto

This play was presented at the 14th Annual Convention of The Ontario Society of Radiographers at Hamilton, on June 3rd, 1949, under the title "We Live and Learn," by the Players' Guild of Hamilton, winners of the 1949 Canadian Drama Festival. We regret that space permits the publication of only a few scenes from the original comedy. The breaks between the extracts are indicated by asterisks.

CHARACTERS

Kenneth Vernon Peake (K.V.P.)
Miss Millie Ampere
Doctor Dapper
Constable Connolly
Nurse Flossie Nightingown
Tommy Tomkins
Bill Burley

SCENE

An X-Ray Room of early days (1910 to 1920). A cabinet to represent old-fashioned machine. Screen, which hides controls of machine. Table, with old-fashioned tube-stand and tube. Two or three chairs. An ordinary table. An x-ray viewing-box. Door, leading to, and plainly marked DARK ROOM. Sundry x-ray films—especially of skull and chest. Cones, cassettes, etc., around room.

(*As the curtain rises, Mr. K. V. Peake is discovered sitting at a table reading aloud*):

K.V.P.—"His body was transparent, so that Scrooge, observing him, and looking through his waistcoat, could see the two buttons on his coat behind."

(*He laughs boisterously, then*):

"Good old Dickens—good old Scrooge! Of all places to find such a snappy description of the fluoroscope—Dickens' Christmas Carol. And the old boy wrote it fifty years before the x-ray was discovered! 'His body was transparent, and Scrooge could see old Marley's rear buttons'!"

(*He shouts, excitedly*):

"Millie, Millie, Millie Amp—ere."

(*Millie enters, her mouth wide open with astonishment.*)

MILLIE—"Oh, Mr. Peake, you frighten me when you yell so loud. What on earth's the matter?"

K.V.P.—"Don't call me Mr. Peake, Millie. It sounds so lofty, so high and mighty, so Rocky-Mountain-ish. "Just call me K.V.P." (*He grins foolishly.*)

MILLIE—"O.K., then, K.V.P. But what did you want me for? Not to practise taking more of those skeleton pictures of me again, if you please. You know far too much about my insides already. Far more than a gentleman should."

K.V.P.—"No, Millie, no indeed. Not business this time. No search for inside information. A purely intellectual interlude. I just want you to hear this priceless little touch from Dickens. Sit up here on the table beside me." (*Millie does so, awkwardly.*) "NOT on the x-ray plates, Millie. They fracture SO easily."

MILLIE—"Excuse me giggling, K.V.P., but you are SO funny"

K.V.P. (*beginning to read*)—"Listen, Millie—listen carefully—'His body was transparent, so that Scrooge —'"

(*Enter Doctor DAPPER. He walks briskly. He is dressed faultlessly in morning coat and grey trousers. He carries a cane. He deposits gloves, top-hat and cane on a chair with deliberation. K.V.P. and Millie remain on and at table as before, staring at him.*)

DAPPER—"Tut, tut, Mr. Peake. Tut, tut, tut! There's always some nonsense going on here whenever I call. Stand up, Peake. And you, woman, get off that table and TRY to look sensible."

(*K.V.P. stands at attention, grinning idiotically. Millie makes an awkward jump from the table.*)

MILLIE—"Ouch! My pet corn!"

DAPPER (glaring at her)—"Corns are nothing to the trouble you have at your other end, woman. And you, Peake, are just as silly. Get me Mrs. MacStinger's gall-bladder, at once"

K.V.P.—"Yes, Dr. Dapper; yes, indeed. Millie—get Mrs. MacStinger's gall-bladder plate. It is next to Mr. O'Hara's left leg in the dark-room. It has a stone in it." (*Millie bolts for the dark-room.*)

DAPPER—"Look here, Peake—while I prefer to make my own diagnosis, you have raised a very interesting point. Is the stone you mention in Mrs. MacStinger's gall-bladder, or in Mr. O'Hara's left leg?"

K.V.P. (*with hand on mouth, stifles a laugh with difficulty*)—"It's just a bullet in the O'Hara leg."

DAPPER—"Just a bullet, eh? I'm amazed that you condescend to radiograph such trifles. Just a bullet! Bah! PLEASE see if you can produce Mrs. Buxom's chest without accident. P-l-e-a-s-e!"

K.V.P.—"Ah, how fortunate! Mrs. Buxom's chest is right here on the table. (*He picks up a skull radiograph and holds it for a few seconds before the viewing box. Then puts it down and a chest radiograph is fitted into the viewing box to stay there*). There is Mrs. Buxom's chest. Constable Connolly's head was resting upon it. A trifle embarrassing, what?, Dr. Dapper!"

DAPPER (*studying the chest radiograph intently*)—"Keep quiet, if you can, Peake. I want to concentrate."

MILLIE—"Yes, let's be quiet, if that will make the old bear—Oh dear!—I mean let's keep Dr. Dapper happy."

K.V.P. (*striking a dramatic attitude—left arm on chest, right one out-stretched*)—"T.B. or not T.B.? THAT is the question."

DAPPER (*looking up at K.V.P. from his study of the radiograph*)—"That is just one question, Hamlet. Another one occurs to me."

K.V.P.—"And that is?"

DAPPER—"How is it you are at large? Why aren't you locked up? We have suitable institutions, I believe."

MILLIE—"Doctor Dapper—How dare you lock him up!"

K.V.P.—"Don't worry, Millie. Doctor Dapper is not serious."

DAPPER—"Don't be too sure about that, Peake. Anyhow, the answer is NOT."

K.V.P. (*looks puzzled*)—"Not what?"

DAPPER (*pointing to the chest radiograph*)—"Not T.B."

K.V.P.—"Splendid. I'm always happy to hear good news—and good poetry."

DAPPER (*as he pulls on his gloves and taps top-hat into place*)—"I would like to give you a word of advice about poetry, Mr. Peake."

K.V.P.—"Nothing could fascinate me more. Let's have the advice."

MILLIE—"Something really interesting, at last!"

DAPPER—"It is this. And listen carefully, poet Peake. Science and sonnets won't mix. Shakespeare and surgery are incompatible. Rhymes and radiography have nothing in common. Medicine and metre are as the Poles apart. Poetry and pills, lyrics and liver, verses and ventricles—Bless my soul, Peake, they're all enemies I tell you. Bitter enemies."

K.V.P.—"I don't agree, Dr. Dapper."

MILLIE—"What about that beautiful poem—'An apple a day keeps the doctor away'—Guess that's what makes you mad, eh?"

DAPPER—"Quiet, both of you! I'm not through yet, Peake."

K.V.P.—"Come, fill the cup, and in the fire of Spring——"

DAPPER—"I'll fill the cup—fill it to overflowing with advice. And you'll find it hard to swallow—you dreamy duffer."

K.V.P.—"Pour away."

DAPPER (*spreads out his hands appealingly*)—"Please be serious, Peake, for a minute or two. My advice is for the good of your soul. Drop all that poetic nonsense. It is a deplorable habit. Shun Shakespeare—stiffle Shelley. Concentrate on radiography and be a useful technician, as I'm sure you can be. Of all the arts poetry is the most useless. Its practical value is nil."

K.V.P.—"On the contrary, poetry, scientifically used, is of intense practical value—even in medical science. And I can prove it to be so."

DAPPER—"That's simply fantastic—absurd—ridiculous. Rhyme without reason, and you know it. How could it possibly be of service to medicine?"

K.V.P.—"As an anaesthetic."

DAPPER (*laughing derisively*)—"Ah, yes. I see what you mean. Poetry always puts me to sleep. Figuratively speaking, of course.'

K.V.P.—"Not figuratively, but actually, the way I use it. Believe it or not I can recite poetry that induces slumber so deep, that under that opiate in verse you could set a Colles' fracture, nip out an apendix, reduce a dislocation, extract a tooth, take out tonsils——"

DAPPER—"And amputate a leg, no doubt. Peake, you're crazier than I thought you were—and that's putting it mildly!"

K.P.P.—"I leave it to Millie to convince you. (*Turns to Millie.*) Miss Millie Ampere, give me your entire attention. What do I do to keep screaming children quiet as lambs when I x-ray them? How do I make the most panicky patient, the most obstreperous character, as putty in my fingers?"

MILLIE—"You recite poems to them. Oh, Doctor Dapper, he does it SO beautifully. And they just close their eyes and go to bye-bye in a minute. Fast asleep and no fooling. It's hard to wake them up again. I sometimes go to sleep at the same time. I have to stuff cotton-wool in my ears to keep awake. It's won-der-ful. Simply won-der-ful!"

DAPPER—"Peake, you are making a big claim and a serious one. And I'm determined to prove it a false claim. I demand that you put me into slumber by reciting poetry. I defy you. I tell you bluntly, you can't do it."

K.V.P. (*making a ceremonious bow*)—"I thank you for the privilege, Doctor Dapper. You will be in the deepest of slumbers exactly (*he looks at his wrist watch*) three minutes from now at most. Probably in two. Have you any favourite poet or poem?"

DAPPER—"Bah—I never read the stuff. Do your worst. I won't go to sleep. I won't, I won't, I WON'T!"

K.V.P.—"Very well, then. Here goes. I shall give you verses with the fullest measure of somnolent quality. Tennyson's 'LOTUS-EATERS,' which is the most potent of literary lullabies."

MILLIE (*as she stuffs her ears with cotton*)—"I MUST stay awake and see the fun!"

DAPPER (*with wide-open eyes*)—"I won't go to sleep, I won't go to sleep, I won't, I won't, I WON'T."

K.V.P.—"Sit down in the chair here, Doctor Dapper, and listen to the gentle music of The Lotus Eaters." (*He approaches DAPPER, who scowls at his ferociously.*)

DAPPER—"Hurry up, you quack—and don't perform any tricks on me if I do fall asleep. Bah! As if I would!'

K.V.P. (*reciting in slow, dreamy fashion*)—

"There is sweet music here that softer falls
Than petals from blown roses on the grass,
Or night dews on still waters between walls
Of shadowy granite in a gleaming pass;
Music that gentlier on the spirit lies,
Than tired eyelids upon tired eyes——"

(*K.V.P. looks earnestly into the eyes of Dr. Dapper At that moment his cane falls with a bang, and his head nods forward. Millie tip-toes forward and gazes at Doctor Dapper.*)

MILLIE—"He's fast asleep. He's in Dreamland by the fast express. He'll be snoring in a minute."

K.V.P.—"Yes, after life's fitful fever, he sleeps well. But I'll give him another poetic pill or two, just for good measure:

"Music that gentlier on the spirit lies
Than tired eyelids upon tired eyes—
Music—that—gentlier—on—the—spirit—lies . . ."

(*Dapper begins to snore in a gradual crescendo of power.*)

"Ah! What a wonderful soporific that stanza is. What an amazing anodyne. Listen! Dapper has a mighty snore. Loud enough to blast the walls of Jericho. Blow, bugles, blow, and set the echoes flying!"

MILLIE—"Oh, K.V.P. What a romantic fellow you are—even about snoring."

K.V.P.—"Thank you, Millie, thank you. I shall go down in history as the Romantic Radiographer—unless

I'm locked up in the meantime as a dangerous character. But back to the table, Millie. Let's finish that Dickens' recital that was so rudely interrupted."

(*They go to the table, MILLIE tip-toe-ing quietly.*)

K.V.P.—"No need to soft pedal, Millie, Dapper's down for a knock-out in the first round. His bugle will be sounding for hours. Listen!"

(*K.V.P. sits at the table—Millie on the table, as before. K.V.P. picks up the book and begins to read again.*)

"His body was transparent, so that Scrooge . . ."

* * * *

(*Enter NURSE FLOSSIE NIGHHTINGOWN. She escorts BILL BURLEY, a workman—well-padded around the middle.*)

NURSE (*reading the x-ray order*)—"Please x-ray Mr. Burley's entire spinal column with spec-ial at-tenshun to the lum-bar re-gion. That's what Doctor Hawkeye orders, Miss Ampere. And I wish you luck."

MILLIE (*with gaze concentrated on BURLEY'S middle*)—"I'll need more than luck, believe me."

NURSE (*caustically*)—"Yes, Miss Ampere. Having seen you at work before, I'm sure you will."

(*Millie sticks out her tongue at FLOSSIE NIGHTINGOWN, who returns the compliment with zest.*)

MILLIE (*turns to MR. BURLEY. She is all sweetness and charm*)—"Are you SURE it's your back that is hurt, Mr. Burley?"

BURLEY (*grinning*)—"That's for them x-rays to find out, ain't it?"

MILLIE—"Of course, of course. But other parts get damaged too. Fingers, for instance. Are your fingers all working well?"

BURLEY (*wigging fingers of both hands*)—"Fit as fiddles, all ten of them."

MILLIE—"And your toes—I'm an expert on toes. Are they in the best of health?"

BURLEY—"Never better. (*stoops to take off his shoe.*) I'll show you."

MILLIE (*holding her nose*)—"Oh, don't bother, Mr. Burley. I'll take your word for it. What about your ankles, your knees, your elbows, your——"

BURLEY (*irritably*)—"Look here, Miss. It's me back the doctor wants a picture of with them x-rays. There ain't nothin' wrong with it, but the guy what hit me with his car is a millionaire, see, an' he's got to pay me plenty, see!"

NURSE—"Do get on with the job, Miss Ampere, and don't waste my time or Mr. Burley's.

BURLEY—"That's the ideer. Get on with the job. I'm a bricklayer an' me time is worth five bucks an hour, see. Don't waste it."

NURSE—"All ready, Mr. Burley. Hop on the x-ray table here and I'll remove the surplus baggage."

(*BURLEY lies on table. FLOSSIE NIGHTINGOWN throws a sheet over him. One by one objects previously concealed are produced from beneath the sheet, and dropped noisily on the floor. A tin lunch pail, a bricklayer's trowel, a jack-knife, a hammer. Then half a brick.*)

NURSE—"Why on earth do you carry a brick around in your pocket, Mr. Burley?"

BURLEY—"Well, you know, it's a sort of trade-mark for one thing. And sort o' useful, too, in case a fellow's held up with one of them bandits."

MILLIE—"Hope he hasn't a wheel-barrow in another pocket. They don't look pretty on the radiographs."

NURSE (*finally produces a folded paper from beneath sheet, unfolds it*)—"Racing Form! Goody! Forgot to buy one myself. Any hot tips for to-morrow's race, Burley, old boy?" (*FLOSSIE N. and MILLIE both lean over him.*)

BURLEY—"Yep. Right from the horse's mouth. Ice-Cream in the first race. That horse always runs fast on a hot track. (*he laughs.*) An' sure enough, there's a horse called X-Ray in the third race. Goes so fast, a fella told me, you can't see it runin'."

NURSE—"What about a bit of a spurt with the x-rays here, Miss Ampere?"

MILLIE—"Wait till I write down those tips. (*She makes notes.*) Ice cream in the first race—X-Ray in the third. Now to business! (*She struggles to place x-ray cassette—plate—under BURLEY'S back.*) Phew! there should be a steam-derrick in every x-ray room!

(*She disappears behind screen where x-ray machine control is supposed to be.*)

MILLIE (*whose head now emerges from behind screen*)—"Take a long, slow breath, Mr. Burley. (*He does so, very audibly.*) Now—hold it, please!"

BURLEY—"I'm holding it tight, Miss."

MILLIE—"Goose—you can't hold your breath and talk at the same time. Let's try again. Take a long, slow breath, Mr. Burley. (*Again the noisy intake.*) Now, HOLD IT, please."

(*All sorts of queer rackets—like a pioneer Ford—heard from behind screen. Then a flash—from photographic flash-bulb.*)

BURLEY—"I gotta breathe again, Miss. I'm bustin'."

MILLIE—"Breathe away, Mr. Burley. I THINK there's something gone wrong with the machine."

NURSE—"It probably has a couple of screws loose—like you, Millie Ampere."

* * * *

MILLIE—"And it was all—my—fault. Boo-hoo-oo!"

K.V.P.—"Millie—please. Don't boo-hoo so boisterously. You make me sad and nervous."

MILLIE (*wiping her eyes*)—"I'm sorry, K.V.P. I'll try to be brave."

K.V.P.—"Atta girl! You can help a lot if you'll be brave. (*He picks up an enormous cardboard sign with a good loop of string to hang it by, and suspends it from her neck. It reads in bold characters, easily read across the hall: OUT OF ORDER.*) There, now, little woman. You look prettier than ever! Just stand at ease there to warn off any prospective patients. No more cases to-day. I'll have another crack at the machine."

MILLIE (*as K.V.P. disappears behind screen*)—"Oh, please, K.V.P. Don't crack it any more!"

(*Sound of hammering heard. Enter NURSE FLOSSIE NIGHTINGOWN. She is holding hands to ears.*)

NURSE (*shouting*) — "Hospital—ZONE OF QUIET." (*Then she looks at MILLIE and laughs. MILLIE displays her tongue with great zest. NURSE places hands cup-fashion around mouth and calls*): "Oh, Mr. Peake. Yoo-hoo!"

K.V.P. (*walking from behind screen*)—"Nurse Flossie Nightingown herself, as I live. What can we do for you?"

NURSE (*pointing to the OUT OF ORDER sign on MILIE*)—"Your diagnosis is correct. But don't forget, Mister Kenneth Vernon Peake, you're just a technician. Let the doctors do the diagnosing."

K.P.P.—

"So many gods—so many creeds,
So many paths that wind and wind,
When just the art of being kind
Is all the sad world needs."

NURSE—"So sorry, Ella Wheeler Wilcox! So sorry. But listen, I'm here on business. I've a telephone message for you."

MILLIE—"Not a girl, I hope."

NURSE—"So THAT'S the situation, eh?"

K.V.P.—"You said you had a telephone message, Miss Nightingown?"

NURSE—"Oh, yes. That woman is still on the line, so I'll hurry. Do you remember taking a—er—(*gigles*) a pregnancy plate on Mrs. Blessing?"

K.V.P. (*all smiles*)—"Yes, nurse, indeed I do. I remember Mrs. Blessing perfectly. We discovered TWO hidden BLESSINGS, small but precious. Have the twins arrived?"

NURSE—"No, the twins are not here yet. She wants to know——"

K.V.P.—"She is still fussing about her bill, I'll bet. She said we had charged her enough for triplets—or even quadruplets."

NURSE—"Nothing of the kind, K.V.P. And please don't interrupt."

K.V.P.—"Then what DOES the woman want?"

NURSE—"Just the answer to a simple little question. Are the twins both boys? She wants boys.'

K.V.P. (*laughing*)—"Wow! So THAT'S the simple question. (*Mops his brown.*) WHAT a question!"

NURSE—"Well—what shall I tell her? She's waiting for the answer."

K.V.P.—"Tell Mrs. Blessing—with my compliments—that after all, there are limits to the powers of the x-ray. Tell her we don't know whether the infants will be boys or girls."

NURSE—"Very well. I'll tell her." (*NURSE begins to walk off stage.*)

K.V.P.—"One moment, Miss Nightingown. (*She stops.*) And please tell Mrs. Blessing that I would be happy to make a little bet with her—five dollars straight—that she will have MIXED Blessings—a boy AND a girl."

NURSE (*smiling*)—"Now that's a smart idea, K.V.P. I wonder if she will make a bet with me also?"

MILLIE—"Me too! But make mine a two-spot. I'm just a poor working girl."

NURSE (*caustically*)—"And what odds would you like, Millie, dear?"

(*Exit NURSE NIGHTINGOWN.*)

K.V.P. (*brightly*)—"Say, Millie—Do you suppose we could organize a pool on this blessed event—Half-a-dollar a chance all over the hospital?"

MILLIE (*sadly*)—"You can, if you like, K.V.P. But I'm all through with hospitals and x-rays. (*She takes off the OUT-OF-ORDER sign and drops it on the floor.*) I've been thinking—thinking hard while standing here."

K.V.P. (*alarmed*)—"Why, Millie, old dear, what's the matter all at once?"

MILLIE—"It isn't all at once—it's been a gradually growing resolve. Listen, K.V.P. Whatever the good Lord designed me for, it wasn't an x-ray technician.

K.V.P.—"Nonsense, Millie. You are doing fine. A little more training and you will be an expert technician!"

MILLIE (*shaking her head*)—"Not in a thousand years. I'll never grow accustomed to those queer skeleton pictures—nor the machines—nor that superior Flossie Nightingown. I'm going back to my flour, my rolling-pin and cook-stove."

K.V.P. (*excitedly*)—"Do you mean to say you're a COOK, Millie, a real COOK?"

MILLIE (*squirming with modesty and embarrassment*)—"In a sort of way, yes. I've won silver cups for my cakes, prizes for my pies, diplomas for my doughnuts, medals for my marmalade, judged best in jams; special awards for soups, sausages and sizzling steaks, and I——"

K.V.P. (*drops on his knees before MILLIE*)—"Tell me no more, my darling. Tell me no more. Why, oh why do you waste your time with fractured legs and funny-bones, with barium meals when you can prepare banquets for the gods? When you can actually COOK!"

MILLIE (*haltingly*)—"Oh, K.V.P. Oh, Kenny Peake. You're much too kind. Much, much, too kind. I'm going to cry in a minute!

K.V.P.—"I'm almost weeping myself—weeping for joy. Millie, I love you, I love you!" (*Millie places her hand upon her heart and sighs, audibly, for joy.*)

MILLIE—"I'm SO happy, K.V.P. So wonderfully HAPPY!"

(*K.V.P. arises from his knees. They embrace.*)

K.V.P.—"MILLIE, my darling—I've always loved you since the first day we met. But that tabulation of your triumphs in the kitchen called for instant action. Do you remember when first we met, oh Millie, my own?"

MILLIE—"I'll never forget it. I came in to get my chest x-rayed."

K.V.P.—"You did indeed. Oh, happy day, oh happy day!

—Your heart upon the screen was shown,
It throbbed for me, and me alone!
Ah! then for joy my heart did dance,
It was the birth of sweet romance—
And your dear heart-beats rang a tune
Like wedding-bells in leafy June.

K.V.P. and MILLIE (*speaking together as they make a graceful bow, holding hands*)—

"And on some sunny day in June
We'll start our happy Honeymoon!"

CURTAIN

Culled from Our Contemporaries

ETHMOIDAL ROOF

Oblique views of the orbits as suggested by Mr. R. Johnson for demonstrating the ethmoidal roof.

METHOD

Patient prone on x-ray table, position head as for optic foramina, *i.e.*, turn head towards affected side, placing the infraorbital margin, the malar bone and the outer canthus of eye in contact with the film or table top. Having thus positioned the patient, proceed to rotate the head until the angle formed by the nose and the table is 45°.

The zygoma on the affected side is now also in contact with the table top or film. The outer canthus of the affected side should be 1" *posterior to* and 1" *below* the centre of the film.

Tilt the x-ray table 18° towards the feet. Direct the central ray so that it passes through the mid point of the bony orbit.

STEREOSCOPIC VIEWS

Having centred the film as for the straight films, displace the x-ray tube 1¾" to either side for 36" distance (focal film). For 40" focal film distance, 2" displacement is needed each way.

FACTORS

High Speed Screens.
Fast Blue Brand or Red Label Films.
36" distance, 67 K.V., 30 M.A., 2 seconds with Potter Bucky.
36" distance, 67 K.V., 100 M.A., 1¾ seconds with Potter Bucky.
N.B.—Other tube tilts used are: 10°, 15°, 20°.

—*The Radiographer*, Australia, March 1949.

FLUORESCENT CONTACT REPRODUCTIONS

By A. F. LANNOY
Cairns, Qld., Australia

In most types of reproduction work, a simple contact method of reproduction using x-rays and screens may be used by radiographers. This method produces excellent results and requires no extra special equipment, such as printing frames, enlargers, etc.

X-ray negatives, ordinary negatives, photographic prints and blue prints form excellent material for this type of reproduction work, although this method has limitations.

The procedure is quite simple. The negative is placed in a cassette fitted with a top screen with the emulsion side of the negative in contact with a film, while the opposite side is in contact with the screen.

Where a photographic print or blueprint is used, the printed surface is taken as the emulsion side.

The cassette is next subjected to an exposure of 6 M.A. seconds at 51 K.V. and 40 inches focal distance. The plate is then developed in the ordinary manner and the result is an exact positive copy of the original, that is, the lights and shades have been reversed.

Repeating the process, using the positive copy gained, an exact reproduction of the original is obtained.

By this method, a considerable deal of time is saved in making reduced negatives and then enlarging, etc.

Many thanks are due to Dr. H. Flecker for his kind advice.—*The Radiographer*, Australia, March 199.

CELLOPHANE COMPRESSION BAND

By W. O. ELLIS
R.A.F. Institute of Aviation Medicine,
R.A.F. Station, Farnborough, Hants.

The possibilities of the use of cellophane in place of linen as the means of holding immovable the part to be radiographed occurred to me some time ago, and its use is proving very satisfactory.

No alteration is necessary to the existing clamping apparatus. Simply replace cellophane for the linen strip by attaching a piece of adhesive tape to each end of the cellohane strip, and making a few turns round the anchoring clip, attach the other end to the roller, winding a quantity on it for use as required.

When soiled the piece is cut off and fresh join made with claw fitting.

The piece used for tests was 4 in. wide and 0.003 in. thick. This will stand any reasonable strain required in general practice.

Some of its advantages are that it is hygienic, low in absorption, transparent, easily obtainable, and of low cost.—*Radiography*, England, April 1949.

MISPRINTS WITH A MEDICAL SLANT

At least once a month, some newspaper or magazine "discovers" and gleefully reproduces one of the classic misprints of all time. This was first perpetrated by the St. Louis Globe-Democrat and reads as follows: "The physician felt the patient's purse and decided that there was no hope."

The following are other slips that actually saw the light of day. For instance, a Kansas surgeon leaving practice got a royal send-off from the Wichita Eagle, which reported: "Dr. S—, one of our most eligible bachelors, is retiring from practice. Hale and hearty at 65, the doctor says all he wants is a little peach and quiet."

Along the same lines reads a neighbourly note discovered in the Little Rock (Ark.) Gazette: "Dr. P— returned home from Baltimore yesterday and will take up his cuties at the hospital."

The Fairmont (N.D.) Sentinel comments mutely on the extent of medical specialization to-day: "Mr. and Mrs. R— left Wednesday for Rochester, Minn., where Mrs. R— expects to have a garter removed by the Mayo Brothers."

The Toledo (Ohio) News-Bee has reddened the faces of medical men with this one: "Mrs. K— continues under the doctor's car. However, at this writing, her condition is somewhat improved."

Doctors probably got a hearty chuckle out of a headline once carried by a Washington (D.C.) daily. Reporting on a mild illness suffered by Franklin D. Roosevelt, the paper announced: "PRESIDENT KEPT TO ROOMS BY CO-ED." The blunder was not discovered until the edition was on the street.

The Columbus (Ga.) Dispatch once jarred its readers with this report: "Recovering from a head injury and shock caused by coming in contact with a live wife, Mr. E— left Mercy Hospital last Wednesday."

A routine announcement in the Morriston (N.D.) News took on new colour when the typesetter dropped two characters from a word: "Miss Dorothy N—, who was injured by a fall from a horse last week, is in St. Joseph's Hospital and is covered sufficiently to have her friends come to see her."

Hospital officials did a double take when they came across an item in the Franklin (Pa.) News-Herald which read: "The donation will be used to purchase new wenches for the hospital, as the old ones are in a dilapidated state."

Among the best eye-brow-raisers are those based on a neat double *entendre*. To top things off, here's a quick sampling:

"The operator of a log truck, charged with reckless driving, crashed in Dr. A—'s rear end, which was sticking out into the road."—Greenville (S.C.) Piedmont.

"Miss R—, an attractive young health nurse, was involved in an accident while motoring in the Cumberlands yesterday. The area in which she was injured is spectacularly scenic."—Norfolk (Va.) Virginia Pilot.—*Condensed from Medical Economics, Dec.* 1948, *by The Canadian Hospital.*

Erratium—April, 1949, Focal Spot, page 94, item 3, sec. 8, should read: "one hundred and eighty days" instead of "one hundred and eight days."

Results of May 1949 Exams, C.S.R.T.

Successful Candidates Eligible For Registration

ALBERTA

Foss Henry Boulton
Henry Taylor Buchanan
Lenore Alphonsine Galarneau
Doris Elaine Gregory
Willa Grierson
Stanley Roy Hendra
Sister Brigid Ann Knopic
Doris Ethel Pearson
Dorothy May Smith
Kathleen Spacklin

BRITISH COLUMBIA

Corunna Amy Chard
Joan Goodall
Eleanor Marsh
Lennard Ray Munday
Florence Anne McDonald
Sister M. Loretto O'Keefe

MANITOBA

Marjorie G. Cooper
Peter Russell Elkin
J. Robert Harmer
Howard L. Norquay
Martha Evelyn Stanton
Edna F. Stuart
Frances Louise Taylor
Kenneth Ernest Wilson

NOVA SCOTIA

Helen Margaret Mackinnon
Sue Purves

ONTARIO

Edith Champness
Christine Fisher
Sister M. Josepha
Burnett Macdonald
Sister Elizabeth Macpherson
Burton McBride
Winnifred..Macfarlane
Gertrude Wishart

QUEBEC

Joan Goddard
Betsey Ann Potter
Betty Stevens
Soeur Cecile Des Anges
Sister Mary of the Sacred Heart
Sister St. Bruno

SASKATCHEWAN

May Alldred
Elna Barnett
Betty Eileen Barrett
Robert David Bradley
Marianne Johnson
John T. King
Leonard R. Stein

MANITOBA SOCIETY OF X-RAY TECHNICIANS

The Manitoba Society of X-ray Technicians has had three very enlightening meetings since last reporting to you.

A very interesting talk on "Dental Radiography" was given by Dr. Wm. Robb at our March meeting, the attendance was good and everyone felt he had learned something in the technique of dental radiographs. Our thanks to Dr. Robb.

At the April meeting Miss P. Lavallee presented a paper on "The Advantages of True A.P. and Lateral Views of the Shoulder Taken at Rightangles," with films to demonstrate her point. A study in "Comparison of Screen and Non-screen Films," showing advantages and disadvantages of each, with films as demonstration, was given by Miss L. Guay. Other items of interest at this meeting were two very educational films, "Principles of Electricity" and "Curves of Color," courtesy of General Electric Co., presented by Mr. G. Martin, assisted by Sister Trottier. Papers and films such as these make it a pleasue as well as an education to attend the monthly meetings of the Society.

Resolutions to be bought up at the forthcoming Annual Convention were discussed at our meeting in May, and Mr. Doern, our Provincial Delegate, received the views of the Society in these matters. Two films, "What is Electricity?" and "Adventures in Research," courtesy of Canadian Westinghouse Co., presented by Mr. Bert Merrin and assisted by Mr. Wm. Doern, were received by the members present with great interest.

In appreciation of their untiring efforts on behalf of the Society, Sister D'Avignon, R.T.; Mr. J. Bodle, R.T., and Mr. Wm. Doern, R.T., were presented with Life Membership Certificates.

We are beginning the summer vacations by having a Weiner Roast on June 27th. It promises to be a gala affair, one which no one should miss.

This appears to bring up to date the activities of our Society, so until Fall we say "Happy Holidays! Technicians."

—MINA STEWART, R.T.,
Sub-Editor.

Life Membership in M. S. X. T. Awarded to Sister M. E. D'Avignon

Sister M. E. D'Avignon, R.N.

Sister M. E. D'Avignon entered nursing school in 1913 and became a registered nurse in 1916 in Calgary, Alberta. After graduation she spent the next fifteen years as a hospital supervisor, devoting most of that time to supervision of operating rooms. For a period she was also general night supervisor.

Sister D'Avignon's x-ray experience dates back to the days of glass plates under the supervision of Dr. W. H. McGuffin of Calgary. In 1935 she was transferred to Manitoba and placed in charge of the x-ray department at St. Boniface Hospital. She became a member of the American Registry of X-ray Technicians and the American Society of X-ray Technicians in 1937. She was accepted into the Canadian Society of Radiological Technicians in 1942.

Sister D'Avignon has been a member of the Manitoba Society of X-ray Technicians since 1935, and has served as Vice-President, as well as on the nominating and the entertainment committees. She has taught a large number of technicians in her department.

Sister is interested in art and her spare moments are well occupied with this hobby.

For her service to the Manitoba Society of X-ray Technicians and for the promoting of technical education, Sister D'Avignon was given a Life Membership on May 27th, 1949.

Mr. J. Bodle and Mr. Wm. Doern, who were also awarded Life Memberships, are well known to Focal Spot readers. Our hearty congratulations to these three distinguished members.

ONTARIO SOCIETY OF RADIOGRAPHERS

14th ANNUAL CONVENTION

THE 14th Annual Convention of the Ontario Society of Radiographers was held at the Royal Connaught Hotel, Hamilton, June 2, 3, 4, 1949. Registration commenced Thursday at 9.00 a.m. and the Annual Business Meeting was called to order at 10.00 a.m. by the President, John Collins. The minutes of the 13th Annual Meeting were read and approved. Mr. Collins reported that all the business arising from the meeting had been carried out, except the striking of medallions for presentation each year to the retiring President; this will be attended to in the immediate future.

The President's annual address was then given. Mr. Collins expressed the hope that this year's Convention would maintain the standard of our former Conventions. He expressed regret that Mr. Alex. Nelson had been unable to remain in office as President this year. Mr. Collins then described his spring trip to Britain, commenting on the working conditions there, and the close association between radiologists and technicians. Our President received a warm welcome in Britain, and was greatly impressed by the efficient and advanced organization of the Society of Radiographers. Mr. Collins outlined some of the executive plans for the coming year, stressing collective effort to better training conditions, more frequent Sectional Meetings, and the investigation of Provincial Licensing. In conclusion, he expressed his appreciation to the members of the Executive for their co-operation.

Scrutineers were then appointed to count the ballots, namely, Mrs. E. Mills and Mr. P. Frederick. The Secretary's report of twelve Executive meetings and outstanding topics dealt with at these meetings followed. It was pointed out that an Ontario Registry would not be published this year in view of the high cost of printing and distributing it, and due to the fact that all Active Members are now listed in The Focal Spot. Our total membership numbers 283, and includes 13 Fellows, 181 Active Members, 17 Associate Members, and 72 Student Members. The Financial Report for the period September 1, 1948, to April 30, 1949, was read and approved.

The next item on the agenda was a report on the educational committee and its projects by Miss Anne Hayward. She stated that study groups had been formed in the various centres and given topics to write up for presentation at Sectional Meetings, Conventions, and ultimately for an educational file to be established for the use of students and others. She called on Mr. Hall who described two meetings held in Ottawa. Miss Hayward then expressed the need for specialized training courses and post-graduate courses for technicians, and a means of sending information and educational papers to technicians in small and remote centres.

Nomination of a new Ontario sub-editor of The Focal Spot was called for and Miss Lucy Keogh, R.T., of Toronto, was elected.

The President called on Anne Hayward to report her findings with regard to Ontario licensing. She pointed out that while the first function of our Society is to promote and advance the work in which we are engaged, there must be some concern for the workers themselves. Other professional or semi-professional groups, such as Canadian Dietetics Association, Canadian Physiotherapy Association and Canadian Nurses Association have similar aims, and are attempting to put into effect methods of promoting the welfare of their members. They have set up committees to study incomes, hours of duty, vacations, sick leaves, pensions and other factors in employment. Miss Hayward then threw the discussion open for those present. It was suggested that a fund be created to cover the cost of future legislation should we decide to seek provincial licensing. It was thought advisable to encourage each province to appeal simultaneously for licensing. It was moved that Miss Hayward be appointed to head a committee to investigate licensing. However, she declined the post for the present, and it was left to the Executive to choose a committee in the fall.

The results of the voting were then announced, the new Executive being as follows:

President: John Collins (acclamation).

President-Elect: Betty Mills (acclamation).

Vice-President: David Sage.

Secretary-Treasurer: Jane Martin.

Executive Committee: A. Stechyshyn, R. McCaw.

Under new business Mr. George Reason moved, Mr. D. Sage seconded, that the Permanent Committee be abolished. This was carried. It was moved by Mr. George Reason, seconded by Mr. Anthony Stechyshyn, than an Advisory Committee of the three immediate Past-Presidents be formed. Amendment was moved that the Advisory Committee consist merely of the one immediate Past-President. This was carried. Meeting adjourned at 11.30 a.m.

At 2.30 the Convention was officially opened by His Worship, Mayor Sam Lawrence, who welcomed all visitors to Hamilton and extended best wishes for the success of the Convention. Rev. F. John Bartlett of Hamilton then gave the invocation. Rev. Bartlett, while a fellow passenger of John Collins when returning to Canada, became very interested in the O.S.R. and promised to give the invocation.

The first technical paper was entitled "Cholangiography—Special Techniques Applied," and was well delivered by Mr. Anthony Stechyshyn, R.T., Senior Technician, at St. Catharines General Hospital. All points in the exploration of the billiary tract were outlined and the importance of this system to man's well-being was clearly shown. The method used was described in a simple and direct manner, and interest was increased by the excellent graphs and slides.

Next Miss Margaret Bartram, R.T., of Sunnybrook Hospital, Toronto, gave an excellent paper entitled "Radiography of the Hip." Routine positions were clearly described and slides were used to demonstrate methods of avoiding foreshortened views of the femoral neck.

The final paper of the afternoon, "A Demonstration of Apparatus for X-Ray of the Feet—Canadian Army Technique," was given by Mr. Charles Robb, R.T., of Toronto General Hospital. During the last war the Canadian Army made a foot survey under the direction of Dr. R. I. Harris and Dr. Thomas Beath. The survey resulted in the improvement of methods of examining and treating foot conditions by the comparison of normal and abnormal feet, x-rayed in exactly the same position and using the same techniques. Slides demonstrated the apparatus used to standardize the techniques and constructed under the combined efforts of Dr. Harris, Mr. T. B. Hurst and Mr. Frank Cunningham.

Following this, all those addicted to golf gathered up their clubs and journeyed to beautiful Burlington Golf Club for a good-natured tournament. The hospitality of the Club was arranged through the kind efforts of our own Mary Cameron. Some hardy golfers played so long that they almost missed the excellent movies which provided entertainment in the evening back at the hotel. First shown was a coloured movie entitled "The Fundamentals of Electricity," prepared by the General Electric X-Ray Corporation. In this the basic principles involved in the production of electricity were shown in a highly interesting manner. Another colour movie, "Operation Crossroads," prepared by the U.S. Navy, had been obtained by Mr. Ken. Hall of Ottawa Civic Hospital. The thrilling spectacle of the Bikiri atom bomb tests from the first preparations to the final photos of the tremendous explosion taken from every possible angle was truly awe-inspiring.

Friday morning a group of "early birds" arrived at the Mountain Sanatorium at 8.00 a.m. to see a demonstration of bronchogram technique. Dr. P. Rabinowitz of the Sanatorium Staff gave a very lucid preamble to the demonstration in which he described the way the method evolved due to the anatomy of the lungs. The visitors then witnessed an actual bronchogram done on a Sanatorium patient, and a few minutes later saw the finished films. The smooth team work was a delight to watch and the excellence of the method was clearly shown in the films. This demonstration was given Saturday morning as well, and a bronchogram done on another patient. All who were privileged to be present expressed the hope that future conventions would include demonstrations such as this for their great educational value.

At 9.00 a.m. Mr. Mark Triller of the Ansco Company presented a paper on "Radiography of the Temporomandibular Joint" and describing a new and unique method of obtaining views of this difficult area. Mr. Triller outlined in minute detail the steps necessary to produce the special A.P. projection of the condyle of the mandible, and illustrated them with coloured transparencies.

The next item on the programme was a very interesting demonstration of a most unusual piece of apparatus — the Angiocardiograph machine, designed and built by the Burke Electric & X-Ray Co. Ltd., Toronto. This latest piece of equipment enables a series of 11 x 14 exposures on a roll to be taken very rapidly — a number to a second — using intensifying screens which come into rapid contact with the film as the exposures are made. An earlier model used non-screen film and was only suitable for radiographing infants, whereas the model demonstrated at the Convention is able to handle adult cases.

Mr. David Sage of McGregor Clinic, Hamilton, then presented the first half of his masterful lecture on "Dentals." He described in careful detail the unique method of dental radiography developed by Mr. A. Bradisson, R.T., of the American Society of X-Ray Technicians and used a live model to demonstrate the bite-blocks and angulations for the various teeth. Mr. Sage's relaxed presentation added to the enjoyment of his paper on a difficult subject.

The next paper on "The Cervical Spine" was given by Mr. L. Staniszewski of Sunnybrook Hospital, and proved an excellent teaching lecture. Again a live model was used, as well as lantern slides to show the correct and incorrect methods of positioning and the resulting films.

Following this Dr. H. J. Porter of Hamilton, a Divisional Director of the St. John's Ambulance Corps, outlined the history and development of the Corps and its present-day value. His talk was thoroughly enjoyed by all.

At 12.30 the Annual Luncheon was held in the Ten o'Clock Club. Guest speaker was Dr. A. E. Walkey, Superintendent of Radiology at Hamilton General Hospital, who was ably introduced by Dr. J. G. Stapleton, Radiologist to the McGregor Clinic, Hamilton. Dr. Walkey's topic was "The Atom" and his enthusiasm and interest in this familiar subject were quickly communicated to the audience ,who listened with rapt attention, fearful of missing a single word. We are truly indebted to him for refreshing our knowledge of "The Atom."

Opening the afternoon session was a "Discussion on Education." Miss Anne Hayward out-

lined the educational aims of the Society, and the steps taken in this direction during the past year. She then introduced Dr. A. C. Singleton, Chairman of the Educational Committee. Dr. Singleton stated that of the two phases of a technician's training good basic training was essential, but careful advanced training was most important. He went on to say that the Canadian Society of Radiological Technicians has a commission on technical training, as has the Canadian Association of Radiologists, and that he is a member of both. A survey by the latter group disclosed that training standards throughout the country vary tremendously. The results of the survey and the commission's report were presented at the C.S.R.T. meeting in Quebec last year.

The commission recommended as a satisfactory curriculum two-year training, one year didactic, one year practical, with study in ethics, administration, anatomy, physics, apparatus, darkroom, protection, therapy, and technique. This curriculum proved satisfactory to the Canadian Association of Radiologists and the Canadian Society of Radiological Technicians. The problem arose of where and how training was to be given, and how it could be standardized. Toronto General Hospital has operated a training school for several years, collaborating in the last few years with Dr. D. T. Burke of Sunnybrook Hospital. For the past two years Dr. Burke has directed courses in Anatamy (at the University of Toronto), and Physics (at the Central Technical School, Toronto). They are at present considering asking the Department of Extension of the University of Toronto to take over the Toronto General Hospital and Dr. Burke's courses.

Dr. Burke, D.M.R. at Sunnybrook, was then asked to address the meeting. He said that we are at present in a time of change in which the difficulties often appear appalling. The need for higher training is obvious. The trend is toward socialized medicine, and we must be prepared for it. If socialism comes we must have the same status as the physiotherapists, etc. We need more elaborate and advanced training schemes. University courses for x-ray technicians have been started in Indiana and St. Louis.

As preparation for advanced training, carry on your educational discussions, stimulate interest in your sectional and annual meetings, and discuss every problem. You need to study for years, to know how to deal with all your difficulties. If you can get a year academic training course established, this may eventually be expanded by using courses already in existence. Your work has increasing possibilities, e.g., one problem is film appreciation. For this you must have some knowledge of pathology — but this may bring you to unethical practices. That hazard must be avoided, and the code of ethics of your society must be hide-bound.

Miss Hayward then stated that it was the duty of the O.S.R. to care for the welfare of its members; that other semi-professional groups had made appeals to the Canadian Hospital Association, etc., seeking legislative enactment of compulsory registration. She asked Drs. Singleton and Burke how we may obtain the latter, and Dr. Singleton recommended that, as a start, we present our aims to the Ontario Hospital Association, and point out to them the advantages of having well-trained technicians. Miss Hayward thanked Dr. Singleton and Dr. Burke sincerely for taking the time necessary to prepare their addresses, and coming to Hamilton to present them.

As a relaxation from the serious discussion, the next item on the programme was the "Brains' Trust." A panel of experts, namely, Dr. Singleton, Dr. J. G. Stapleton, Hamilton; Mr. Ken Hall, R.T., Ottawa, and Mr. Frank Weale, R.T., Hamilton, capably answered a barrage of questions on many phases of radiography.

Then, Mr. L. J. Cartwright, F.O.S.R., Hospital for Sick Children, gave a most interesting paper entitled "Orthorentgenography." In this he outlined the old and new methods of measuring bone length and proved the merits of the up-to-date method by radiographs taken in both ways.

One of the highlights of the Convention took place Friday evening. Dr. C. E. Vaughan of Hamilton was the extremely capable chairman for the occasion when the Players' Guild of Hamilton, winners of the 1949 Canadian drama festival, presented a delightful play entitled "We Live and Learn," by Percy Ghent, radiography's George Bernard Shaw. The serious prologue, written in collaboration with Mrs. Mary Cameron, outlined the history and growth of the O.S.R., following which this little fantasy depicted the lighter side of radiography, and its mood was carefully portrayed by the players. The large appreciative audience echoed with applause Dr. Vaughan's compliments to the players and stage crew on a splendid production.

Saturday morning, the first paper, on "Sinuses," was given by Dr. D. T. Burke, D.M.R. of Sunnybrook Hospital. In a concise but thorough manner Dr. Burke dealt with the accessory nasal sinuses under the following headings: development, purpose, anatomy, radiographic changes, and technical considerations. Slides and radiographs demonstrated that multiple views are imperative and that each view must show all sinuses. It was recommended that a routine examination should include the Waters, Caldwell, submento-vertical and lateral projections in the upright position, and that anatomical landmarks rather than standard specific degrees of angulation should be used to obtain these projections. Dr. Burke mentioned that planigraphy may be resorted to in special cases, but questioned the necessity of using contrast media.

The second section of the lectures on "Dentals" was next presented by Mr. David Sage, and adequately completed the demonstration of Mr. Bradisson's technique.

Mr. Ken. Hall, R.T., Ottawa Civic Hospital,

presented a very interesting paper on "The Structure of Matter." He discussed the composition of atoms and their isotopes, leading up to the formation of such complex atoms as Uranium 238. He also described the process of disintegration of U-238 and the by-products formed in its break-down. Mr. Hall also gave us an excellent outline of the mechanism of the atom bomb and the reactions involved.

The final paper of the morning was a "History of Medicine," presented by Miss Anne Hayward, R.T., Hamilton General Hospital. Using picturesque lantern slides, Miss Hayward traced the origin and development of the science of medicine from the witch doctors who inhabited the caves of southern France to some of the outstanding scientists.

In the afternoon we were privileged to see a film on "Cinefluorography," presented by Mr. Frank Dreisinger, R.T., with a commentary by Dr. Robert Bloor, both of the Department of Radiology, University of Rochester. Cinefluorography is a recently developed method of obtaining a record of fluoroscopic examinations. At Rochester they have developed a machine incorporating a very powerful camera with a special fluoroscopic screen and special movie film. To date use of the equipment is confined to experimental study, but improvements are being made to lead to more general use. They have shown the process of swallowing and demonstrated joint motion in many areas. Movie films shown were extremely interesting, particularly those showing barium passing down the patient's esophagus while the patient was turning around. It will be most interesting to follow the future use of this new equipment.

The "Use of the Zirconium Light" was then described by Miss Barbara Bolton, S.M., Sunnybrook Hospital. By shining the zirconium light on various models representing vertebrae, femora, sinuses and fluid-containing antra, etc., and thus projecting their shadows on a wall, Miss Bolton clearly proved the importance of many points vital to radiography, including the size of focal spot, focal-object distance, correct alignment of vertebrae, and correct centering. This proved a most unique method of demonstrating many of the basic rules we must learn to produce accurate radiographs.

One of the outstanding lectures of the Convention was the final paper, "Cerebral Air Studies," by Mr. Walter Whitehouse, R.T., of Toronto General Hospital. Using his own accurate drawings, he discussed the anatomy of the brain as shown in ventriculograms and encephalograms and the preference for either method. One particularly unique drawing demonstrated the movement of the injected air in the various positions used to show the air passages of the brain. The excellent radiographs shown clearly demonstrated the perfection of Mr. Whitehouse's methods.

As a memorable climax to our meeting the radiologists of Hamilton entertained the Convention guests at a delightful cocktail party held in the Mural Room. With serious matters forgotten, all took pleasure in the generous hospitality of Drs. T. W. Dean, W. L. Harwood, C. E. Hess, C. G. Hurley, J. G. Stapleton, C. E. Vaughan and A. E. Walkey.

Following this the annual banquet was served in the Crystal Ballroom, during which the President, Mr. Collins, read a telegram of best wishes from Mrs. Mary Cameron attending the Convention of the American Society of X-Ray Technicians in far-off San Francisco. Mr. Collins was presented with a Ronson lighter with the Society crest as a token of appreciation for his diligent work during the past year. Guest speaker of the evening was Rev. Norman Rawson of Centenary United Church, Hamilton. Rev. Rawson is an outstanding Canadian orator whose inspiring talk, "You Can't Go Back," alternately thrilled and delighted his audience.

This account would not be complete without mentioning the excellent exhibits which were displayed around the lecture room. Sincere thanks must be given to Dr. Vaughan, Dr. Stapleton and Mr. S. Olheiser, F.O.S.R., of London, who had the difficult task of judging the films.

And credit must be given to the hard working Convention Committee — John Collins, Chairman; David Sage, Secretary-Treasurer; George Reason, Hotel Manager; and Miss E. Chiasson, Social Convenor. Their diligent efforts resulted in an outstanding Convention which will long be remembered.

We wish to acknowledge the co-operation of Canadian Kodak Company Ltd., X-Ray Services and Supply, Ansco of Canada Ltd., Ferranti Electric, X-Ray and Radium Industries Ltd., Bell-Craig, C.I.L., Picker X-Ray, Burke Electric and X-Ray Co. Ltd., (General Electric) X-Ray Corp. Ltd., Discarded Films Products, Canadian Breweries Limited. And we wish to thank Mr. E. Fanning of London for his generous personal contribution.

—JANE MARTIN, R.T.,
Sub-Editor.

University Extension Course for Student Technicians to Start This Fall

The Educational Committee of the Ontario Society of Radiographers announces that arrangements have just been completed for a beginners' course in Radiographic Technique under the auspices of the Department of Extension, University of Toronto. This course must be followed by two years' practical student work in a hospital before the student is eligible to write the C.S.R.T. examinations for registration. The fee for the course is $150 and the number of candidates must not exceed twenty. There will be eight months of lectures and practical demonstrations and four months of supervised practical work. Three weeks' holidays will be given during the period.

Four Hospitals are participating. Toronto General Hospital, Sunnybrook, Sick Children's and St. Michael's. Students will be allotted to each hospital participating and they will be rotated every three months.

Outlines of Course:

Anatomy—twenty evening sessions in anatomy department, University of Toronto. Six evening sessions Sunnybrook Hospital.

Physics—forty-five hours during day or evening, at discretion of Department of Physics, University of Toronto.

English—from thirty to ninety hours.

Pathology—about fifteen hours.

Apparatus—twenty-five hours—T.G.H.

X-Ray Therapy—sixteen hours—T.G.H.

Radium Therapy.

Isotopes.

Dark Room Chemistry—four hours.

Principles of X-Ray Technique and Radiographic Positioning—96 hours.

The course begins this Fall. Applications are invited immediately and should be sent to Dr. A. C. Singleton, Toronto General Hospital. It is desirable that the authorities should receive applications as soon as possible in order that arrangements may be made to allot students to classes of existing courses. The age limit will probably be thirty.

If the number of candidates for the full course is less than twenty, other technicians may be accepted up to that number for the classes in Anatomy and Physics (no age limit). The fee will probably be $24.00.

—ANNE HAYWARD.

BRITISH COLUMBIA. con from p. 119.

HEAR AND THERE

Congratulations to Miss Kay Parsons on her recent marriage.

Congratulations also to Miss Mary Bancroft who will be married to Mr. G. Hook before this appears in print.

They're off! The delegates, that is. And may they all prove winners. These moving notes have been compiled while en route to Halifax in order to catch the July deadline.

The Convention should prove successful. Wait and see. All members who are proceeding on vacation ars extended the best wishes of all for a happy time.

—W. Q. STIRLING, R.T.,
Sub-Editor.

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SASKATCHEWAN SOCIETY OF X-RAY TECHNICIANS

SIXTH ANNUAL CONVENTION

The Sixth Annual Convention of the Saskatchewan Society of X-Ray Technicians was held on May 24th, 1949, at Regina. Registration at the Grey Nuns' Hospital began at 8 a.m. with over fifty technicians signing the register. The meeting was called to order at 9 a.m. by the President, Mr. George Derrick. The members were welcomed by Dr. A. E. Perry. The Annual Business Meeting was held from 9 to 12 noon when the members adjourned for luncheon. The afternoon session was held in the Lecture Room of the Regina General Hospital, commencing at 2.30 p.m., with a paper entitled "Adequate Views of the Os Calcis," given by Mr. S. G. Johnston, Moose Jaw General Hospital, illustrated with slides demonstrating a fracture in the oblique view, whereas the lateral and plantar-posterior views looked quite normal. At 2.45 Mr. P. E. Hunt, President C.S.R.T., gave a very interesting talk, explaining the aims and objects of the C.S.R.T. and what the parent society has accomplished during the past few years. Mr. Hunt invited the audience to ask questions regarding the C.S.R.T. and gave answers which cleared up any points raised by those present. Next followed an address by Mr. George Jackson of the Picker X-Ray Corporation, Montreal, on "The Basic Factors in Radiographic Technique." The speaker gave a very clear outline of x-ray physics; explained the four prime factors necessary to a good radiograph and how to manipulate each factor; pointed out the common mistakes which most of us have made and some still make and ended his talk with radiographs which illustrated the points he had mentioned.

After a short recess the meeting was called to order for another business session.

The following officers were elected for 1949-50 season:

President: Mr. J. P. Connell, Regina.

Vice-President: Mr. S. G. Johnston, Moose Jaw.

Secretary-Treasurer: Miss Marie Perron, Saskatoon.

Executive: Rev. Sister Hopcraft, Regina; Mr. Harold Mattison, Swift Current.

Associate Director and Official Delegate—Mr. Harold Mattison, Swift Current.

Focal Spot Sub-Editor: Mr. Douglas Penley, Regina.

A gratifying response was made by first and second year students to an invitation to submit films and papers dealing with any phase of x-ray work, prizes being offered for the best contributions. The following were awarded prizes:

1st Year Students: Radiographs—Miss Doreen Symons, Medical Arts Clinic, Regina. Papers—Miss Doreen Symons, Medical Arts Clinic, Regina; Mr. Schneider, Saskatoon Sanatorium, Saskatoon.

2nd Year Students: Radiographs — Miss Houghton, Providence Hospital, Moose Jaw. Papers—Mr. Bruce, Medical Arts Clinic, Regina.

A vote of thanks was tendered to the Grey Nuns' and General Hospital management for the facilities provided for the meeting. One suggestion which was passed at this meeting was that all clinics and hospitals in the province should be notified of the date and place of our next convention, requesting that all technicians possible be allowed to attend. The 1950 Convention is to be held in Saskatoon on or before May 24th. After the closing of the meeting we were invited to the Medical Arts Clinic where cocktails were served.

The Annual Banquet, attended by about 75 technicians and guests, was held in the Novia Cafe, the guest speaker being Dr. C. F. W. Hames, Deputy Minister of Health for Saskatchewan. The varied program which followed was enjoyed by all and a full and busy day finally concluded with Dancing at the Trianon.

The 1949 Convention was a very successful one and with everyone supporting the new slate of officers we feel confident that we shall make steady and sure progress in the future.

—S. G. JOHNSTON, R.T.,
Sub-Editor.

That the Sixth Annual Convention was so successful is very important to the Saskatchewan Society, but why it was successful is much more important. The Regina Branch is to be commended upon their efforts in preparing the convention, but most commendable is the attitude shown by the Saskatchewan members as a whole—a very prevalent unanimity of purpose and keen interest in the Saskatchewan Society of X-Ray Technicians.

With the conclusion of the Provincial Convention, Society activity has been reduced to but a few members; everyone else too busy with their plans for holidays. Well and good—an enthusiastic Fall can be foreseen.

Talking of enthusiasm, there is an enthusiastic group of technicians in Moose Jaw who have had the advantage of the knowledge of a very enthusiastic person—our own Percy Hunt—and every third Friday of the month he has been driving over to Moose Jaw to lecture these technicians on "The Fundamentals of X-Ray and X-Ray Technique."

Reports have been coming in from all points in Saskatchewan where Mr. Geo. Jackson, Picker representative, has been visiting. George's advice on techniques, positioning, swimming etc., has been gladly received.

—D. PENLEY, R.T.,
Sub-Editor.

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